Edgewood Quarterly

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ARMY ACTIVATES THE FIRST BIOLOGICAL DETECTION COMPANY

The military's first unit whose sole mission is to detect the use of biological weapons has been formed at Fort McClellan, AL. In October, an Army Reserve unit, the **310th Chemical Company**, was redesignated from a motor smoke company to a Biological Integrated Detection System (BIDS) company. The unit is assigned to the 81st Regional Support Command in Birmingham, AL, and is composed of four reserve platoons, a headquarters platoon, and an active-duty platoon. Each of the five platoons has seven BIDS teams consisting of two vehicles (the M31 BIDS Humvee and a Humvee support vehicle) and four soldiers.

The BIDS, which was built by the Office of the Program Director for Biological Defense Systems located at the Edgewood Area of Aberdeen Proving Ground, MD, is a

nondevelopmental item that went from concept to First Unit Equipped in less than 4 years. This multipurpose system provides monitoring, sampling, detection, and identification of biological warfare agents.

Army officials decided to change the company's mission in the wake of the Persian Gulf War when then-chairman of the Joint Chiefs of Staff, General Colin Powell, testified before congress that the United States was well-equipped to deal with chemical and nuclear threats; however, it was not well-prepared to defend against biological warfare. That candid assessment served as a wake-up call and led to the development of the BIDS and the establishment of the BIDS training facility dubbed the *BIDS Bunker*.

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This newsletter is distributed to over 500 addressees throughout the Joint Services and would be a good vehicle to publicize what is going on where you are. Please submit articles to Technical Director, Edgewood Research, Development and Engineering Center, ATTN: SCBRD-ASC, Aberdeen Proving Ground, MD 21010-5423, or by electronic mail to scbrd-asc@apgea.army.mil. The editors reserve the right to edit, including verification of facts, removing redundant or ambiguous language, and proofreading. The newsletter is prepared for publication by the Scientific and Technical Information Team:

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THE RESERVES ARE SMOKING

With the recent downsizing of the active component of the U.S. Army, the mission of the reserves has become more critical then ever to our national defense and execution of our foreign policy. This expansion of mission and emphasis on readiness can not be accomplished without improved or new equipment, additional training, and a new force structure.

In FY95, the U.S. Army Reserve Command (USARC) in Altanta, GA, initiated an aggressive $25M, 3-year modernization program to meet this new challenge. The Joint M157 and Joint Project team with representatives from the Product Manager for Smoke and Obscurants, U.S. Army Chemical and Biological Defense Command; the Armaments, Chemical and Acquisition Logistics Activity; and the Product Manager for the M113 Family of Vehicles, U.S. Army Tank-Automotive Command; teamed with the USARC to modernize their large area smoke and decontamination mission.

M157A2 Smoke Generator and M1059A3Smoke Generator Carrier

The current Army-fielded mobile smoke generator applications include the M3A4 Smoke Generator, the M157 Smoke Generator Set, and the M1059 Smoke Generator Carrier. The M3A4 consists of a pulse jet smoke generator which can be mounted on a Humvee (High Mobility Motorized Wheeled Vehicle) using a M1/M2 or M288 mounting kit. The M157 Smoke Generator Set consists of two pulse jet smoke generators, remote control panel, fog oil tank, fog oil pump assembly, and air compressor assembly mounted on the M1037 Humvee using the M284 mounting kit. The M1059 Smoke Generator Carrier is identical to the M157 Smoke Generator Set except for a 120-gallon fog oil tank and it is integrated into an M113 Armored Personnel Carrier. The existing smoke generators use MOGAS to fuel a pulse jet engine that produces heat to vaporize fog oil. The vaporized fog oil is released in the air where it recondenses to produce large white visual obscurant clouds.

The first M157 materiel change added safety and operational improvements identified by the user (such as high altitude operation) to the fielded system. The M157A1 Smoke Generator Set was type classified in October 1993. The second materiel change further modified the M157/M157A1 to operate on all mid-viscosity fuels (such as JP8, JP5, JP4, DF2, DF1, DFA) in accordance with Department of Defense Directive 4140.43 on fuel standardization. The M157A2 Smoke Generator Set and the M1059A2/A3 Smoke Generator Carrier with the M157A2 retrofit kit was type classified in December 1994.

Large area smoke companies within the USARC are Corps assets. The companies that support heavy divisions use the M113 Armored Personnel Vehicle and are called mechanized smoke companies. The companies that support light infantry divisions are mounted on Humvees and are called motorized companies.

Prior to FY95, none of the reserves' mechanized versions were M1059s. In fact, all companies used the M3A4 smoke generators. The primary drawback to this force structure was the inability of these companies to keep up with the rest of the heavy division in rough terrain. The rest of the reserves' smoke and decontamination capability was divided between 32 companies and based in large part on the M3A4. Only two of these companies used the M157 mounted on a M1037 Humvee.

In FY95, the Department of Defense established the new reserve force structure to include four mechanized (armored) smoke companies to support their heavy divisions and 25 motorized (wheeled) dual-purpose smoke and decontamination companies to support the remainder of their structure.

Since the existing mechanized smoke companies were in the worst shape, the reserves tackled this problem first. The reserves modified an existing contract with the United Defense Limited Partnership to refurbish and upgrade 87 M1059 Smoke Generator Carrier systems to M1059A3 systems. The upgrade included the Reliability Improvement System Enhancement, which significantly improved the vehicle's engine and transmission and resulting mobility. Originally, this contract was for the upgrade of M113A1 Armored Personnel Carriers to the M113A3 configuration. With the downsizing of the USARC force structure, the reserves already had excess M113A3s. Since the M1059 was originally a modification to the M113 Armored Personnel Carrier, the Product Manager for the M113 asked the Product Manager for Smoke to return the M1059s to their original configuration to allow the reserves to use the existing contract and protect their $14M investment.

The Product Manager for Smoke's proposal to manage the refurbishment and upgrade of the M157s to the M157A2 configuration and integration into the existing United Defense Limited Partnership contract was accepted in October 1995. Work started almost immediately at our facilities in building E5265 at the Edgewood Area of Aberdeen Proving Ground. The team prepared a manufacturing and quality assurance plan and transformed E5265 into a manufacturing facility, including special test and inspection equipment, special jigs, fixtures, and manufacturing floor layout. After disassembly of the M1059s, the smoke equipment was shipped to PM Smoke for refurbishment and upgrade. The team's technicians worked long hours, under an accelerated timetable, and met every challenge.

In July and August 1996, the first two of four mechanized reserve companies were fielded new production M1059A3 Smoke Generator Carriers with the latest M157A2 "Multifuel" smoke generator systems. The joint team completed the total packaging fielding to the delight of the respective battalion commanders and provided the reserves with the best visual mobile smoke capability within the Army. Even more responsive to the fieldings were the soldiers, who received for the first time mechanized smoke equipment. They found out first hand that it is fun to make smoke. The remaining two companies are scheduled for fielding in May and June 1997.

With the unbridled success of the mechanized program, the reserves initiated a second, concurrent customer program to completely convert all the motorized companies into dual-purpose smoke and decontamination chemical companies. The team fabricated and fielded over 432 new production M288 mounting kits to mount the M3A4 smoke generator to the M1037 Humvee, 120 retrofit kits to upgrade existing M288 mounting kits, and 48 retrofit kits to upgrade existing M284 mounting kits.

The existing smoke companies carried their M3A4 smoke generators as loose cargo in M998 Humvees. Unfortunately, the M998 has insufficient payload to support the future M157A2 systems. The Product Manager for Smoke redesigned the M288/M284 mounting kits to make them interchangeable with the new M284A1

mounting kit for the M157A2 system. PM Smoke then fabricated new components for new production and retrofit kits to allow the reserves to easily upgrade their M288 or M284 mounting kits to accept the M157A2 smoke system without further modification. This process resulted in a design that will retain over 95 percent of the original investment during the conversion from M3A4 to M157A2.

M1059/M157A2 Mechanized System

Starting July 1, 1996, the first of 25 companies were fielded a combination of this equipment at 11 different sites around the continental United States. Members of the joint M157 Team participated in fieldings from South Bend, IN, to Sioux Falls, SD, to Fort Jackson, SC. At every location, the soldiers participated in the fielding, retrofit, or refurbishment. They reveled in the opportunity to modernize their equipment and make a difference. The last fielding at Fort Lewis, WA, will be conducted by members of the joint team in December 1996.

However, the job is not yet finished. A meeting with the customer in early November resulted in further efforts. The reserves have now asked the joint team to help with the local training and refurbishment of their M3A4 smoke generators and M17 decontamination equipment. Pending identification of the funding, the team will be ***on-the-road*** again next summer.

The team is also supporting the final Production Qualification Test at Dugway Proving Ground, UT, of the new M157A2 production systems and retrofit kits. These items will start fieldings in July 1997 and begin the final upgrade of dual-purpose companies to their final configuration.

Members of the Joint Team

The exceptional teaming effort of the reserves with the joint M157 team resulted in a significant, long-term upgrade in the readiness and operational capability of the reserves. In addition, the reserves' investment has nearly eliminated the previous program funding shortfall. Future collaborations between us and our customers will mean more successes as we move the entire force into the 21st Century.

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EVOLUTIONARY PROCESS DEVELOPS TECHNOLOGY BASE PLAN AT THE EDGEWOOD RDE CENTER

New Technology Base Plan is top-down driven, bottom-up built!

Historically, the Army's Edgewood RDE Center was the proponent for its NBC Technology Base mission. Specifically, the Director of Research, in conjunction with the vertically integrated commodity directorates (e.g., Detection) and the Associate Technical Director for Technology decided how the mission money allocated for NBC Technology Base was distributed. Division and Branch Chiefs served as subject area managers who briefed the Directors on project status. The Director of Research had control of the money and resources and could change course when it became necessary to do so.

> The Technology Base Plan documents the near-term chemical and biological (CB) defense R&D program. The plan contains as a minimum the technical objective with a description of the work, milestones, funding level and execution plan, and the justification or rationale for performing the effort.

Although the process worked reasonably well, there were shortcomings. These shortcomings, along with changes in the external environment, pointed to a need to make process adjustments and improvements.

Process shortcomings included several "internal" concerns. These perceived problems included a lack of technical expertise in evaluating and approving individual proposals, subjectivity in proposal evaluations, a process that did not appear to be "open" to everyone, and a lack of overall documentation. The workforce was not sure who was involved in the process, how the proposals were evaluated, where individual proposals were ranked, and what rationale supported the final Technology Base Plan. Although long-range strategic plans projected what equipment would be needed in the field in 5 to 15 years, the funds allocated to research and technology development were not always optimally linked to the conceptual equipment identified in the long-range plan. Because research and technology funding levels were higher in previous years, some efforts were funded that perhaps did not always have the high potential payoff. For instance, money was often allocated to a project based on how well the researcher was able to justify continuation of a project to the subject area manager.

There were external influences as well. First, the current government downsizing and recent substantial cuts in the Technology Base budget means less resources are now available to meet CB Defense R&D requirements.The Edgewood RDE Center was directly affected, and after a major reorganization in 1993, middle management levels, which included Technology Base subject area managers, were eliminated. In addition, Public Law 103-160 caused Department of Army funds for NBC defense to be consolidated with those from the other services as Department of Defense funds — making all NBC defense funds joint service. Now, the Joint Service Materiel Group builds the long-range strategic plan and all the services are players. The Technology Base Plan is now approved by the Technical Panel for CB Defense (TPCBD); the panel includes representatives from each of the four services. These changes necessitate that the limited Technology Base resources (people and dollars) be highly focused to get the most technology for the money for all Services.

To address these external forces and to reduce or eliminate the perceived internal concerns, analysts from our Operations Research and Analysis Team, supported by their contractor, TASC, developed and facilitated a decision analytic approach to develop the Technology Base Plan in FY96. The evaluation process is based on decision support methodology, the Analytical Hierarchy Process (AHP), and associated software, Expert Choice. Several refinements were added to the process for FY97.

The overriding objectives of this process are to ensure that the approved Technology Base Plan represents an appropriate technology investment for CB defense and to gain "buy-in" from all organizational levels, bench through management, including CB Defense customers. It is also critical that the results of the Technology Base planning process and the supporting rationale be documented.

Before initiating the FY97 Technology Base Plan process, background information and suggestions for process improvement were obtained from those involved in the FY96 planning efforts. A "Process Plan" was developed, which was approved by the TPCBD. The process to develop the FY97 Plan was implemented in June-July 1996.

The initial step of the process identified seven Technology Base Plan business areas:

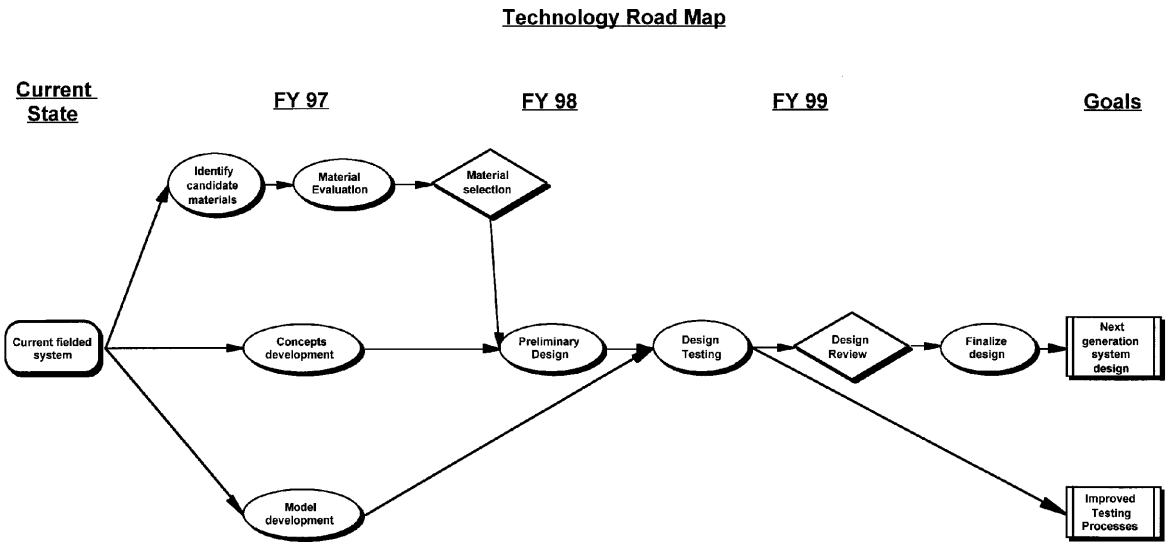
Biological Detection
Chemical Detection
Individual Protection
Collective Protection
Decontamination
Smoke/Target Defeat
Core Science & Technology

During business area reviews held early in the year, management and the "worker level" had the opportunity to exchange information and discuss issues on 6.1, 6.2, 6.3, and related customer programs.

A major component of the FY97 Technology Base Plan process was the creation of Business Area Managers and Committees for each business area. Business Area Managers were selected based on background, experience in the particular business area, and general management ability. Committees were created for each business area and included representation from across the organization as well as the other Services. The members had diverse expertise in science, technology, hardware, programmatic aspects, and customer requirements. The primary responsi-bility of each committee was to evaluate and rank Technology Base proposals and to prepare a recommendation package for their business area.

Joint Service participation was formally instituted during the FY97 Technology Base Plan process. The Biological Detection Business Area was selected for integration from a joint service perspective because of the vast interest in this area among all the services as well as various customers and higher headquarters. The Biological Detection Committee was carefully selected to ensure that it contained a well-rounded representation of all services to increase joint service input.

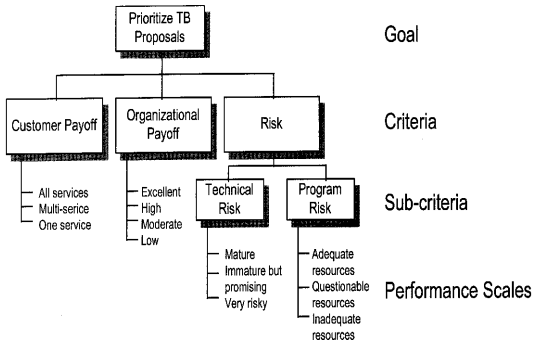
The concept of Technology Road Maps was introduced in the FY97 process. Prior to evaluating the technical proposals, each business area committee was asked to consider developing a Business Area Technology Road Map. The purpose of the Road Map is to provide an overall framework for the research efforts within a business area, facilitating a more comprehensive and integrated technology program.



Generic Road Map

Developing a Road Map before evaluating proposals allows the committee to see how each proposal fits into an overall research framework. It provides rationale for why the individual technology projects are critical to the goals of the business area. It also shows how projects may mutually support each other.

When proposals are evaluated, they can be portrayed on the Road Map, showing where proposed efforts may be combined or where research gaps still exist and a request for further proposals must be sent out.



Evaluation Model

The evaluation process was based on the Analytical Hierarchy Process (AHP) decision support methodology and associated software, Expert Choice. The AHP was developed in the 1970s by Dr. Thomas Saaty and is used to develop decision models that support the intuitive decision-making process. In the AHP, evaluation criteria are structured in the form of a hierarchical tree, the criteria are weighted through pairwise comparisons, and alternatives are then evaluated in terms of the criteria. Both quantitative and qualitative criteria can be assessed, resulting in a set of normalized scores for all alternatives, which can then be further reviewed through sensitivity analysis. The decision support analysts assisted the committees through the evaluation process by providing overall direction, facilitating the evaluation sessions, running the software, providing analytical guidance, ensuring neutral and unbiased input, conducting sensitivity analysis, and interpreting results.

The format and instructions for proposal submissions were posted to our electronic bulletin board in April 1996. This posting included the tentative evaluation criteria for each of the seven

areas, and the submitters were given a suspense of one month for submitting proposals.

Although each committee used the same basic systematic approach to evaluate and rank the proposals submitted for their business area, they were independent and did not necessarily use the same criteria or the same weighting factors. This flexibility was allowed because criteria that are critical in one functional area may not be so important, or even relevant, in another.

Each committee generated a prioritized list of proposals based on their evaluation model. The proposal scores and overall results of the AHP evaluation were reviewed by the committees to make sure they made sense; *the AHP software does not make the decision but is only an input to the decision*. The model is intended to help organize and structure the evaluation, and the scores are used as guidance; adjustments were made if discussions concluded that changes were indicated. The committees then submitted their recommendations to the Resource Program and Planning Team of our Research and Technology Directorate. This team consolidated the individual inputs, verified that the funding requests were properly documented, and submitted the proposals for each business area to the R&T Director or to the Joint Service Technical Panel for CB Defense for approval.

The vast majority of committee recommendations were accepted. However, some adjustments were made to ensure a balanced and focused overall program. After a final funding review by the Resource Program and Planning Team to ensure requested dollars did not exceed the anticipated budget, the approved FY97 Technology Base proposals were released to allow program planning and execution to begin.

The FY97 effort to follow a documented process and evaluation methodology to develop the Technology Base Plan continues to build on the success and progress of the initial year's efforts. Realizing this process will continue to evolve and mature, each committee member was asked to provide recommendations, criticisms, or suggestions to improve the process.

Overall, the process was well-received. The committee members felt they were given the opportunity to voice their opinions, which resulted in buy-in from most members. The facilitated sessions provided a forum for open discussion, which led to consensus within the teams. Since the committees were composed of members from across the organization and other services, most members felt the overall process was more "open," there was more sharing of knowledge and expertise, and the potential for biases and prejudices was minimized. There was less subjectivity in ranking the proposals since the process was not based so much on intuition, but instead relied on defined evaluation criteria and a proven mathematical methodology. Most importantly, the rationale for prioritizing Technology Base proposals was defined and documented. Unlike earlier years, the proposal submitters learned the strengths and weaknesses of their proposals and understood why their proposal was or was not funded.

The FY97 process was the second year that we generated the Technology Base Plan using a decision analysis methodology facilitated by the Operations Research and Analysis Team. Plans for the FY98 process are well underway and include establishment of electronic (internet) decision support to enhance joint service participation.

A technical report is in process, which describes the overall approach, the evaluation methodology and implementation, lessons learned, and recommendations to improve future technology base planning.

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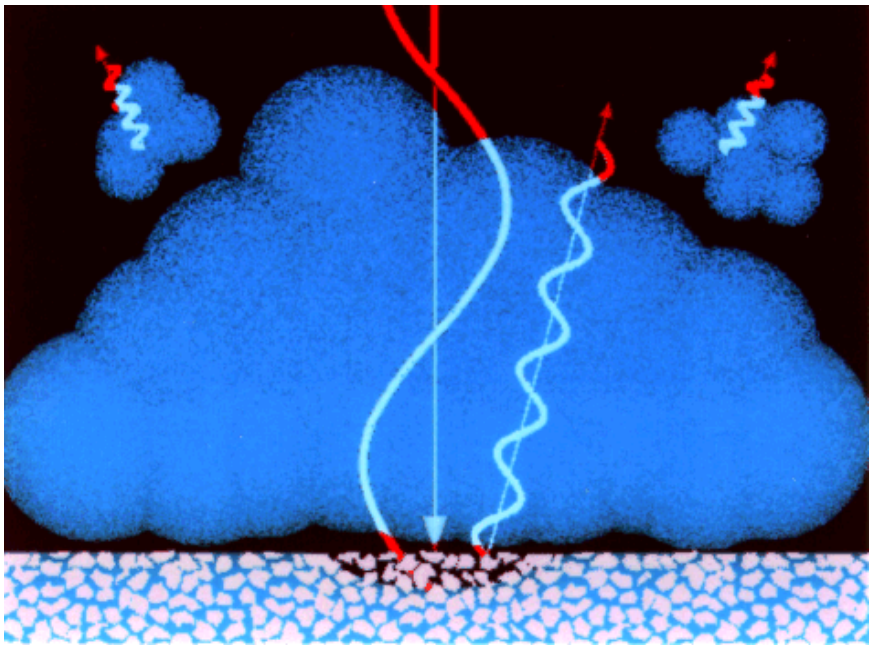
TACTICAL THERMOLUMINESCENCE SENSOR



Late in FY95, an engineering effort began to transition *Thermoluminescence Spectroscopy* from research to prototype development. It is an ongoing effort to field a novel and proven surface contamination detector. Detection of ground contamination by Thermoluminescence spectroscopy was discovered at the Edgewood RDE Center and proven feasible for the first time in 1985. Thermoluminescence detection technology was subsequently patented at Edgewood in 1993 (U.S. patent 5,241,179). Several related patents are now pending.

The *Tactical Thermoluminescence Sensor* accurately measures surface contamination while on-the-move in an especially equipped military Humvee with shelter. This vehicle will eventually be integrated with state-of-the-art optics, electronics, software, signal processing, and neural network pattern recognition sensor modules.

The *Tactical Thermoluminescence Sensor* concept involves irradiation by magnetron or laser beam sources whose energy is strongly absorbed into the contaminated ground. Scattered and reflected beam energy is blocked from entering the sensor receiver while Thermoluminescence flux, liberated at the irradiation zone, is made to pass through an interferometer and brought to focus onto an IR photo conductive chip. The irradiating beam causes a build-up in localized ground temperature and the development of a thermal gradient across and into the ground surface. When this gradient is maximum, the emissivity contrast between contaminant and background is at its greatest. Within this thermal window the liberated Thermoluminescence is collected by a telescope, operated on by interferometer optics, Fourier resolved into frequency (energy) space, preprocessed with various mathematical algorithms, and finally processed by a neural network pattern-recognition system for yes or no detection decisions.

This technology is relevant to the requirements of the Army, Navy, Air Force, and Marine Corps. We demonstrated the Thermoluminescence technology in October 1996.

We believe that this tactical *Thermoluminescence* prototype sensor, with slight alterations, has many beneficial applications and that the potential for commercialization is high. In addition to assisting the chemical contamination problem, civilian applications are many, varied, and very beneficial. In agriculture, this system could scan surfaces of growing fields to detect contaminants – oils, herbicides, fungicides, and insecticides – and provide concentration maps.

The Environmental Protection Agency's application for this sensor could include identifying leaking gasoline storage tanks and environmental **Superfund** cleanup tasks.

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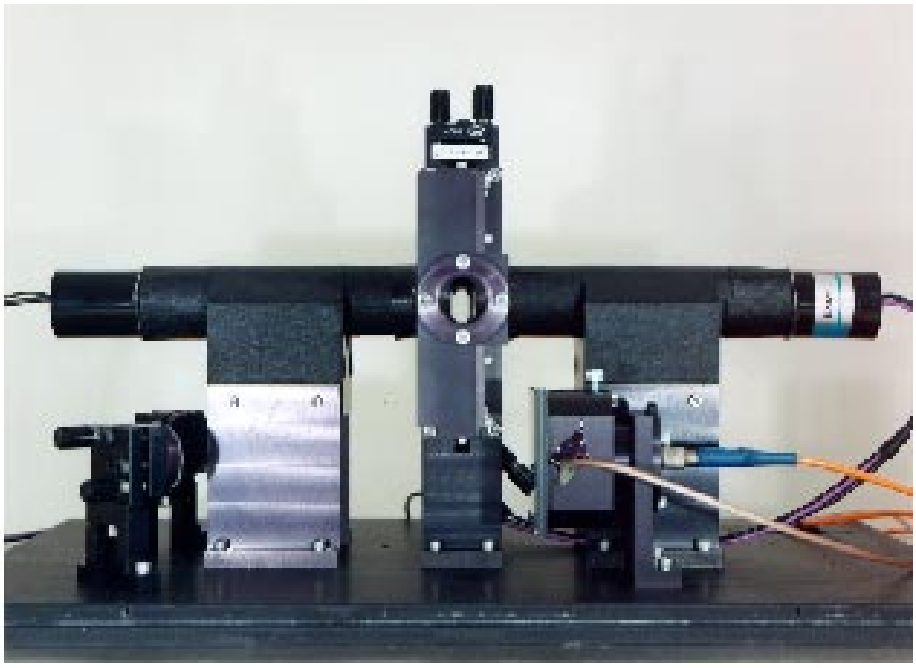
MICRO-LASER BIO-AEROSOL FLUORESCENCE DETECTOR



The Micro-Laser Bio-Aerosol Fluorescence Detector is based on the Lincoln Laboratory's Ultra Violate (266nm) micro-laser. It is being developed as an integral part of the Biotechnology Advanced Technology Demonstration by Lincoln Laboratory at the Massachusetts Institute of Technology.

This innovative laser fits in the palm of your hand and is combined with two photo multiplier tube detectors to collect the fluorescence emitted by the bio-particle. The breadboard system has an acquisition personal computer and power supply attached via a 25-meter cable.

The system went from an idea, through design and integration, and into testing in only 6 months. It is being tested at the Joint Field Trials at Dugway Proving Ground. At present, the detector uses a 10X aerosol preconcentrator; the next 6 months will be spent eliminating this preconcentration step.

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CHEMICAL AND BIOLOGICAL COUNTERPROLIFERATION LONG-TERM PLANNING

The Edgewood Research, Development and Engineering Center is an element of the U.S. Army Chemical and Biological Defense Command, located at the Edgewood Area of Aberdeen Proving Ground, MD. The Science and Technology Assessment Team is part of the Advanced Systems Concepts Directorate within the Edgewood RDE Center and is responsible for assessing long-term (5-25 years) warfighter needs and technology concepts to satisfy these needs.

The Science and Technology Assessment Team took the initiative to conduct a 2½-day ***Chemical and Biological Counterproliferation Seminar War Game*** at Booz-Allen and Hamilton in May 1995 and a 1-day Workshop in September 1995 at the same location. The participants were warfighters and technologists representing CB counterproliferation from the Army, Navy, Air Force, Marine Corps, academia, and industry.

The overall assessment objectives:

- Use warfighters to determine our long-term chemical and biological counterproliferation system needs.
- Use technologists to identify out-year technologies.
- Establish plans to capture and transfer these technologies to address the capability needs.

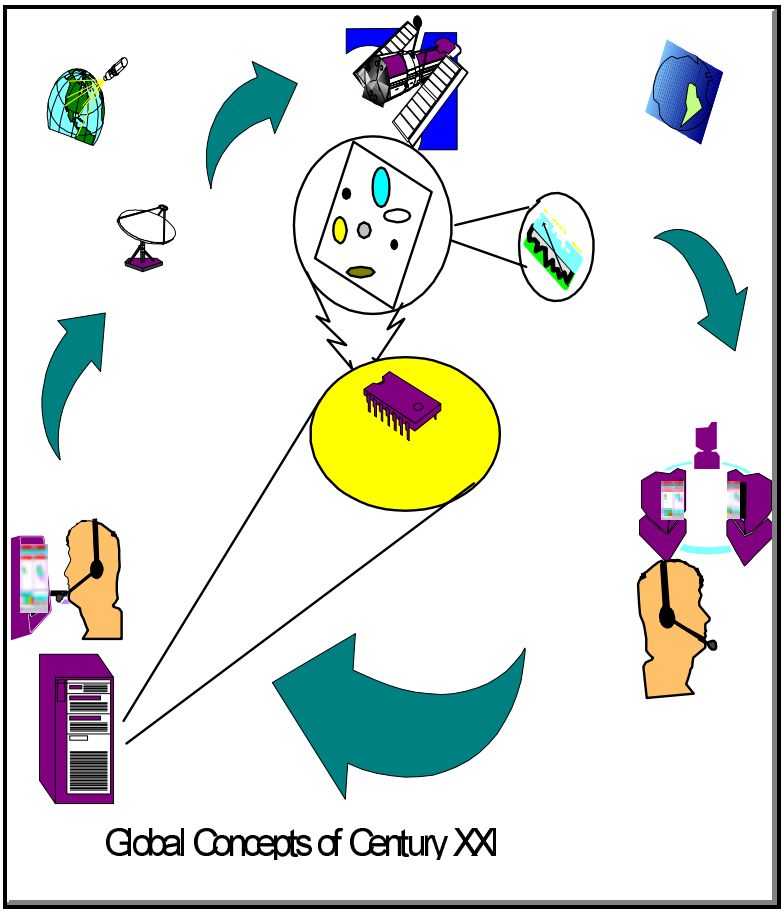
The War Game players were organized into defensive (blue) and offensive (red) chemical and biological teams. Each team was provided with two Mid East scenarios and requested to develop defensive and offensive strategies based on these scenarios. Team sessions were organized into mission planning and desired chemical and biological counterproliferation capability sessions.

The teams identified 17 CB counterproliferation warfighter needs.

The workshop was conducted to evaluate the current CB counterproliferation technologies against the most critical warfighters's needs identified in the process of the War Game. Based on these results, the 17 long-term desired capabilities and needs were reduced to the following 8:

- Intelligence data fusion with chemical and biological data integrated
- Long-Range and early warning detection
- Sampling and identification in unmanned configurations for remote use
- Inexpensive and scatterable detectors
- Destruction of CB agent production and storage facilities with little or no collateral effects
- Methods for quantifying residual hazards to support modeling and predicting effect
- Antiviral drugs and advanced vaccines for individual medical protection from BW agents
- Improved (less burdensome) individual protection

The following figure illustrates a technology solution to some of the capability needs by using an interactive global system of systems.



This system's concept uses the CB detector information that is collected on a computer chip at various locations and relays it to a computer to present as audio and video displays and translated as warnings to other command control locations. This system of systems will allow the warfighter to transmit and receive information anywhere on the globe.

The recommendations from this study are ongoing and require periodic updates to determine new technological breakthroughs.

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WEB SITE ON LINE

Please visit the NBC RDA Business Area of CBDCOM, known as the Edgewood Enterprise, on the world wide web. Our url address is:

http://www.apgea.army.mil/RDA

CHEMICAL MOBILE LABORATORY SUPPORT

Personnel in our Operations Directorate recently completed their support to the Chemical Mobile Laboratory Project. This effort started in July 1995 at the request of the Arms Control and Treaty Support Directorate of the U.S. Army Chemical and Biological Defense Command. Our support included the procurement of modified Real Time Analytical Platforms (RTAP), acceptance testing of the vehicles, training of Russian personnel in the use of the vehicles, preparing the vehicles for shipment to Moscow, and the commissioning of the vehicles in Moscow.

Mr. Arthur J. Fitzgerald, Edgewood Center, determined the modifications needed and arranged for the procurement of three RTAPs within the established delivery schedule. The first ***International RTAP***, a four-wheel drive, diesel powered, 16-foot High Cube Van mounted on a 1995 GMC model 3500 Sierra truck was delivered to the Edgewood RDE Center in December 1995.

Ms. Kelly Maguire was responsible for the logistics involved with the operation of the three vehicles while at Edgewood and with coordinating acceptance testing and Precision & Accuracy Testing on the analytical equipment prior to the Russians arriving for training.

SciTech Services, Inc., was contracted to develop a 4-week training plan for the Russians and to actually conduct the training. Because of the language barrier, the training was conducted with the aid of interpreters from the On-Site Inspection Agency. SciTech also developed an operations manual for the ***International RTAP*** to be used as a reference guide for future Russian RTAP operators.

In August, Edgewood Center's Ms. Maguire and Ms. Laura Tinsley, Senior Scientist for SciTech Services, Inc., traveled to Moscow for the commissioning of the three RTAPs. Following the commissioning of the vehicles, an official transfer of custody to the Russian Ministry of Defense concluded our support for this project.

The RTAP is a self-contained mobile unit whose mission is to perform near real-time, low-level monitoring of chemical agents. The RTAP was originally designed and built to satisfy a Department of the Army safety requirement to provide low-level monitoring for chemical surety materiel storage sites.

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AMC TREATY LABORATORY
ISO 9001 CERTIFIED

A certification team from the American Association for Laboratory Accreditation (A2LA) completed its review of our AMC Treaty Laboratory on June 20, 1996. No major or serious deficiencies were noted, and in October we were notified that our laboratory had received ISO 9001 registration and ISO/IEC Guide 25 accreditation.

The A2LA considers facilities, procedures, and capabilities before granting accreditation. To demonstrate capabilities we showed data from our recently completed proficiency test for the Organization for the Prevention of Chemical Weapons (OPCW). Successful completion of the proficiency test is one step in the process to become a "designated laboratory." The test consisted of three spiked samples (water, organic liquid, and solid polymer). Participants were allowed 15 days to perform the analyses, identify any Chemical Weapons Convention (CWC) related compounds in the samples, and prepare and submit the final report. The AMC Treaty Laboratory completed all facets of the test within the prescribed time and is confident of success.

"I'm tickled pink," said Richard G. Roux, Director, Arms Control and Treaty Assistance.

Accreditation is a particularly significant accomplishment given the scope and complexity of the processes and procedures required by the CWC and its implementing body, the OPCW.

The A2LA auditors were impressed by the quality of our people and by the processes and products they crafted in seeking accreditation. This was indeed a team effort. Congratulations to the entire team!

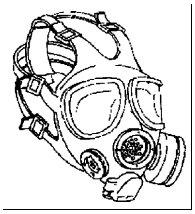
Our modular laboratory was originally designed to support the multilateral Chemical Weapons Convention, the Bilateral Destruction Agreement and Wyoming Memorandum of Understanding. All of these treaties include provisions for sampling and analysis to verify compliance. This created a need for an on-site analytical capability during Chemical Weapons Inspections.

But the uses of the laboratory are not limited to Chemical Weapons inspections. It can provide an instant on-site capability in any circumstance where a temporary laboratory is needed and conditions do not support a mobile laboratory. The system is adaptable and can be expanded to include other analytical systems as on-site laboratory needs change.

This was most notable during the recent Olympic Games. Our AMC Treaty Lab on-site team deployed on July 10th to Atlanta to support the Centennial Olympics. No chemical sample analysis missions was required, but we did conduct an analysis for explosives. Several senior level visitors were briefed on the system and there was exceptional interest from other government agencies on the laboratory's portable Gas Chromatograph/Mass Spectrometer equipment and on the laboratory's quality program.

POC: Mr. Richard G. Roux, Director of Arms Control and Treaty Assistance, Commercial (410) 671-7689, DSN 584-7689, or email rgroux@apgea.army.mil

Fieldings

 M40A1/42A1 Mask	MD, DC & PA Army Reserve Units DC, DE, MD & PA Army NG Georgia National Guard Florida National Guard & Army Reserve Panama VA, IA, IL & IN National Guard POC: MAJ Gary Nasers AMCPM-NNM, DSN 584-6591	Sep 96 Sep 96 Oct 96 Oct 96 Nov 96 Nov 96
 M41 Protection Assessment Test System	Fort Hood, TX Rhode Island National Guard DE, NH & TN National Guard SOCOM (Panama) Florida National Guard POC: James K. Church SCBRD-ENP-C, DSN 584-6575	Sep 96 Sep 96 Oct 96 Nov 96 Dec 96
 NDI Biological Integrated Detection System	Fort McClellan, AL 3rd Plt FLOATS 4th Plt POC: MAJ Steve Moore AMSCB-BD, DSN 584-2835	 Sep 96 Oct 96 Jan 97
 M21 Chemical Agent Alarm	Fort Hood, TX Fort Stewart, GA POC: MAJ Gary Nasers AMCPM-NNM, DSN: 584-6591	Sep 96 Oct 96

Fieldings (continued)

 M3A4 SmokeGenerator/ New Plus Mounting Kit	USARC 342nd, 379th, 389th and 378th Dual Purpose Cml Co., Fort McCoy, WI USARC 323rd Cml Co., Sioux Falls, SD USARC 326th, 304th, and 318th Dual Purpose Cml Co., Fort McClellan, AL USARC 327th and 340th Dual Purpose Cml Co., San Antonio, TX USARC 314th Dual Purpose Cml Co., Fort Gillem, GA USARC 307th, 414th, and 371st Dual Purpose Cml Co., Fort Jackson, SC POC: Richard W. Decker AMCPM-SM/M157, DSN 584-8374	Sep 96 Oct 96 Oct 96 Nov 96 Noc 96 Nov-Dec 96
 M3A4 SmokeGenerator/Update M288 Plus Mounting Kit	USARC 401st Dual Purpose Cml Co., Fort Gillem, GA POC: Richard W. Decker AMCPM-SM/M157, DSN 584-8374	Nov 96
  Components of the M157 Smoke Generator System	Materiel Management Center, NTC, Fort Irwin, CA POC: Richard W. Decker AMCPM-SM/M157, DSN 584-8374	Dec 96
 M56 Mechanical Smoke Generator	Chemical School, Fort McClellan, AL Fort Bragg, NC POC: Randal H. Loiland AMCPM-SM/M56, DSN 584-2806	Mar 97 Mar 97

END ITEM UPDATES

ITEMS TYPE CLASSIFIED:

The new **M45 Aircrew Chemical-Biological Mask** was recently type classified-standard. The new mask system will replace the Army's M49 Mask System. The mask provides the required CB protection without the aid of forced ventilated air while maintaining compatibility with rotary-wing aircraft sighting and night vision devices.

The **M1 Laser Ballistic Outsert** was type classified in October. The M1 Outsert is a Preplanned Product Improvement for use on the M40/M42 CB Protective Masks. It will provide two wavelength laser protection as well as ballistics protection. The M1 is an Additional Authorized List (AAL) item for the masks.

NOMENCLATURE/TYPE DESIGNATOR CHANGE REQUESTED:

Previously approved nomenclature, **MASK, CHEMICAL-BIOLOGICAL: aircrew, M45**, was changed to **MASK, CHEMICAL-BIOLOGICAL: M45**. The M45 Mask will now be used by aviation and infantry; therefore, *aircrew* is misleading.

VALUE ENGINEERING CHANGE PROPOSALS:

M40A1/M42A2 Series Masks – A cooperative effort between the U.S. Army Tank-Automotive Command's Armaments, Chemical Acquisition and Logistics Activity (TACOM-ACALA) and the U.S. Army Chemical and Biological Defense Command (CBDCOM) has produced a significant Value Engineering cost savings from the facepiece assembly, Mask M40A1/M42A2. When a facepiece failure occurs, the current procedure replaces the whole mask; the new procedure allows the soldier to replace only the facepiece. The total savings for FY96 is $1.75M and is based on a buy of facepieces at Pine Bluff Arsenal. FY97 and FY98 estimated savings of $2.8M are based on a contract buy of masks. Savings are credited equally ($2.275M) towards TACOM-ACALA and CBDCOM Value Engineering goals for FY96.

ENGINEERING CHANGE PROPOSALS (ECP):

M27 Service Kit – Four ECPs were approved that permit the use of commercial specifications as alternates to government specifications. Four other ECPs, which were disapproved previously, were resubmitted with additional information by the contractor. Ridge Instrument Inc., the contractor for the M27 Service Kit, submitted these ECPs to eliminate the pressure testing at the component level of the hose fittings since they are also tested at the higher assembly. The Board reevaluated these ECPs and, based on expected savings, requested a higher amount of savings than the contractor's original proposal. The approval of these ECPs should result in a savings of $5,000 in the current contract and will increase the producibility of the M27 Kits. The M27 Kit is used to service the M3 and M5 Riot Control Equipment.

M17 Series Lightweight Decon – An ECP to add a ball valve to the M17 and A/E 32U-8 Siphon Injector was approved in October. This ECP is being done in conjunction with Materiel Change 1-96-08-8001. This idea came out of Desert Storm, where conservation of water was critical and was part of Edgewood suggestion #

085-90. Implementation of the Materiel Change associated with the ECP is dependent on availability of funding.

M43A1 Chemical Agent Detector – An increasing number of Direct Support Maintainers reported that the stenciled radioactive warning labels are illegible. Depot maintenance has a silk screen available to replace this marking; however, logistically it is impractical to supply a silk screen to all Direct Support Units. An ECP was approved to replace the marking with a printed aluminum foil label, which has the same markings; the label material and adhesive are the same as that used on the detector serial number plate and bottom case instructions. Maintainers will be directed to requisition the label when the radioactive marking is illegible.

Specification Scrub for M43A1 Chemical Agent Detector – An ECP was approved to remove approximately 35 percent of the Federal and Military specifications from the technical data for the M43A1 Chemical Agent Detector Bottom Case. These specifications were removed from two specification control drawings, a sole source drawing, and an assembly. The method of imprinting part numbers on the assembly was simplified and MS screws were replaced with commercial designations. This ECP will be incorporated into a new solicitation for the bottom case. A solicitation waiver will still have to be approved for the remaining mandatory Federal and Military specifications referenced in the technical data.

Solicitation Waiver for the M256A1 Chemical Agent Detector Kit – Mr. Jimmy Morgan, Director of ACALA, has signed the first solicitation waiver for a chemical item. The waiver is for a $616K solicitation for 14,292 M256A1 Chemical Agent Detector Kits. The waiver will allow procurement to proceed with the solicitation using mandatory Government specifications and standards. Engineering at Rock Island had previously reviewed the technical data and determined that use of the technical data and the Government specifications and standards referenced in the TDP was mandatory. This rationale was based on the military uniqueness of the item, and the cost and time to develop and procure using a performance specification.

M14 Gas Mask Leakage Tester and Q127 Penetrometer Filter Tester – Two ECPs recently approved the use of a new aerosol challenge media. DOP, which is used as the challenge aerosol media on the Q127 Tester, is a suspected carcinogen. Similarly, maintenance related problems were encountered by the use of mineral oil as a challenge media on the M14 Tester. The new challenge media, NSN 9150-01-436-3615, is a commercially available lubricating oil also known as Durasyn 164. Durasyn 164 eliminates the safety and maintenance problems associated with the use of DOP and mineral oil on the M14 and Q127 Testers, respectively. Modifications to the Instruction Manuals will incorporate the National Stock Number for the new challenge media.

M18A2 Chemical Agent Detection Kit and M30A1 Refill Kit – The technical data packages for the M18A2 and the M30A1 have been scrubbed. An ECP was written to eliminate 30 callouts for use of Military Specifications and Standards. This is about one-third of the total military callouts. These specifications were either replaced with Commercial Specifications or eliminated altogether.

M157A2 Smoke Generator – Two ECPs were recently approved. One will correct minor errors in the specification and incorporate some design and cost effective improvements. Minowitz manufacturing proposed material changes to the fog oil tank that will reduce the cost of the tank. A change to raise the allowable weight of the tank by 5 pounds was also approved. Minowitz proposed consolidating two cables and a terminal board into one assembly; this proposal should increase the reliability by eliminating failure mechanisms. The second action dealt with reducing the number of spare parts for the M157 family. When the M157A1 was developed, some minor changes were made to the nozzle assembly. Also, some changes were made to the nozzle assembly when the M157A2 was developed; resulting in three different configurations

of the nozzle assembly. The Product Manager for Smoke/Obscurants reviewed the changes to the nozzle assembly, determined that the changes were minor, and that the nozzle assembly for the M157A2 could be used for all three systems. An ECP was approved to eliminate the unnecessary drawings and update the tech data to reflect this decision. This action is the first step in an effort to assess and eliminate redundant or unnecessary spare parts and reduce the number of National Stock Numbers that must be maintained for the M157 Smoke Generator family.

M8 TA Smoke Pot – An ECP for completion of the technical data for the M8 TA Smoke Pot was approved. The ECP upgraded the packaging requirements, provided alternatives for canceled specifications, and made a number of editorial changes. This approval was provided to Pine Bluff Arsenal and permits the purchase of metal parts and other long-lead-time components for the production of the M8 Smoke Pot.

M8 HC Smoke Grenade – An ECP was approved that will consolidate many common drawings for the current series of smoke grenades (M8, M18, M7A2, & M83) and resulted in the cancellation of more than a dozen drawings. The implementation of this action significantly improves the technical data packages for the four items and reduces the overall cost of the storage and maintenance of stored drawings. The action also incorporates many of the improvements that were developed with the M83 TA Smoke Grenade resulting in the improvement of the standard grenade items.

M825 WP Smoke Projectile – An ECP for the Self Supporting Burster used in the M825A1 WP Smoke Projectile (155mm) was requested by Alliant Techsystems, Ferrulmatic Operations, and provides for an expanded sampling of a failed lot to gain a better representation of the statistical population while not permitting the acceptance of any lot that exhibits individual test failures.

M825A1 WP Smoke Projectile – Two ECPs were submitted by the Armament Research and Development Engineering Center. The first recommended the addition of two alternate 303 and 304 stainless steel materials for the M825A1 Self Supporting Burster Plug. The Plug drawing already permitted alternates of ordinary carbon 1018, 1020 steels and a 302 stainless, so it was determined that the two similar stainless materials would be acceptable and would improve the availability of the plug. This ECP was approved as written. The second ECP was written against the M825A1 Self Supporting Burster Spring Pin. The Pin drawing currently requires a chamfer on both edges that made production difficult and was not considered necessary. The review board recommended approval of the ECP to make one of the chamfers optional. Prior to the approval of this ECP, it was recommended that a tolerance stack up investigation be conducted to ensure that the constructive change would not significantly impact the overall part.

MATERIEL CHANGES:

M825A1 Projectile – The Pine Bluff Arsenal (PBA) Contracting Officer for the Self Supporting Burster Contract for the M825A1 Materiel Change program has requested that Alliant Techsystems, Ferrulmatic Operations, order 8,850 production burster components in conjunction with the purchase of the parts for the First Article quantities. It is expected that this up-front purchase of long-lead-time components will improve the delivery schedule by more than 6 months and permit PBA to produce sufficient quantities of M825A1 Projectiles to meet the field demand during FY97.

EQUIPMENT UPDATES:

M40A1/M42A2 Mask Contract Awarded – A firm fixed price, multiyear contract for the production of the M40A1/M42A2 CB Protective Masks, and the spare part facepiece assembly was awarded to ILC Dover in

November. This contract was solicited as a best value acquisition which evaluated price and past performance. The contract period covers requirements for FY96-00; average price of the mask is $81.00. Total evaluated price of ILC's proposal was $53.5M. Deliveries are scheduled to begin in June 1997.

Chemical Agent Monitor – Amendment of the CAM Nuclear Regulatory Commission license with Improved CAM parameters is anticipated no later than the end of December and the renewal request will be submitted no later than January (current license expires 1 March 1997).

CAM Buzzers – In September, we got an urgent request from Fort Hood for CAM buzzers to support units rotating to Bosnia. Since turnaround time was too short to get the equipment from the depot, we FedEx'd six buzzers from our Program Manager's stock in time to meet their deployment schedule – excellent example of customer support.

XM32 Advanced Integration Collective Protection System (AICPS) – The first Engineering Development Test prototype was successfully demonstrated. The AICPS is an advanced air filtration system integrated with environmental control and exportable power source for vans and shelters. It can be integrated into more than one configuration to provide protection to different tactical systems. It will reduce filter change logistics by using a filter that will last at least 3 years.

M254 Service Kit – A complete review of the Service Kit Supply Catalog was completed and a series of recommendations forwarded to the Item Specialist. These changes will be made available to the field through an updated CD-ROM supply catalog format during 2QFY97.

M21 Remote Sensing Chemical Agent Alarm – Intellitec will complete their production contract for the M21 over 2 months early (without any cost overrun) and plan a celebration in Deland, Florida in mid-December.

L11A1 CS Anti-Riot 66mm Vehicle Launched Grenade – Transitioned to the Product Manager for Smoke/Obscurants as part of the Light Vehicle Obscuration Smoke System (LVOSS). The LVOSS Operational Requirements Document now specifies a requirement for a riot control capability.

MINICAMS – Deployed a 4-wheel-drive pick-up truck with a real-time Lewisite detection MINICAMS to Black Hills Army Depot to support the U.S. Army Corps of Engineers remediation effort. This is the first real-time detection of its kind, and we are having great success.

Sorbent Decon System – In September, Phase I and Phase II of the advanced development contract was awarded to Guild Associates. The Sorbent Decontamination System involves the baselining and optimization of a new sorbent for wiping or spraying down personnel during immediate decontamination. In Phase II, the new sorbent will replace the resin currently in the M295 Individual Equipment Decontamination Kit. Phase III is scheduled for award in FY99.

NBC Equipment HOT LINE/HELP Toll-Free Numbers

Germany - 0130810280
Korea - 0078-14-800-0335
CONUS - 1-800-831-4408

BRIEFS

CHEMICAL WARFARE CONVENTION. The following information is quoted from **THE BALTIMORE SUN**, November 1 edition, page A22.

CONVENTION BANNING CHEMICAL WEAPONS TO TAKE EFFECT IN APRIL

UNITED NATIONS *– A landmark convention banning the development, production, stockpiling, and use of chemical weapons will become effective April 29, after Hungary became the 65th country to ratify the accord, a U.N. spokesman said yesterday.*

The convention, opened for signature by Secretary-General Boutros Boutros-Ghali in January 1993, was designed to come into force 180 days after the United Nations received the 65th ratification.

A technical secretariat headquartered at The Hague will be responsible for verifying that its provisions are carried out.

END OF ARTICLE

EDGEWOOD TEAM EVALUATES SCREENING TECHNOLOGIES FOR CWC INSPECTIONS. Our Operations Research and Analysis Team recently completed a study for the Treaty Verification Team, which evaluated various chemical sample screening technologies for Chemical Weapons Convention inspections. An evaluation team of Edgewood subject matter experts was formed in late February 1996. The team participated in a series of evaluation sessions which identified the objective of the study, developed potential screening CWC inspection scenarios, identified and described 25 screening technologies or items to evaluate, developed and weighted 24 evaluation criteria and performance scales, and rated the screening technologies and items relative to the criteria. This information was then analyzed. The resulting database of information was used to match the most promising alternatives with specific inspection scenarios and to identify technical challenges or data gaps. POC: Mr. John A. Walther, Operations Research and Analysis Team, Commercial (410) 671-3569, DSN 584-3569, or email jawalthe@apgea.army.mil

ERDEC SUPPORT TO OSHA. Analytical Chemists confirmed trace levels of sulfur mustard (H) and high levels of nitrogen mustard (HN-3) in samples taken from the scene of an industrial accident in Baton Louisiana where numerous workers reported moderate to severe blistering after a routine cleaning operation. We confirmed OSHA's analytical results, which suggested that H and HN-3 were in the samples. To aid OSHA investigators at the scene, a team of experts from Edgewood RDE Center was assembled to provide rapid response and assistance. In addition to information suggesting possible reactions leading to the formation of the agents, methods for monitoring, decontamination, sample handling, preparation of standards, and laboratory analysis were provided. POC: Mr. William T. Beaudry, Research and Technology Directorate, Commercial (410) 671-3863, DSN 584-3863, or email wtbeaudr@apgea.army.mil

INTERNATIONAL TESTING OF CB HAZARD REDUCTION TECHNIQUES. Our CBCT Team, the Royal Canadian Mounted Police, and other foreign representatives completed successful field trials of advanced hazard reduction techniques. Timely development of these techniques will benefit first responders to a chemical or biological incident. The Edgewood RDE Center has hosted this annual event since 1993. Promising technologies investigated this year included vapor suppression systems and foam mitigation and

render-safe procedures for non-explosive devices. POC: Mr. James A. Genovese, Commercial (410) 671-1915, DSN 584-1915, or email jagenove@apgea.army.mil

1996 JOINT WARRIOR INTEROPERABILITY DEMONSTRATION. In August, the Modeling and Simulation Team participated in this event, which is a yearly joint communications demonstration focusing on a Joint Task Force with connectivity to the Commander-in-Chief and the Service components. It demonstrates distributed communications and information technology in an operationally relevant context. The JWID96 focus was advanced battlefield planning tools and was sponsored by the Joint Staff with the Army as the lead service and the United States Central Command as the host CINC. We participated as part of the Defense Modeling and Simulation Office (DMSO)-sponsored, "C4I Integration for the Warrior." This was one of 35 programs selected for JWID out of 170 proposals submitted. We demonstrated our Chemical, Biological and Radiological Simulator for Planning. The Simulator was incorporated into the Common Operational Modeling and Planning System to allow Joint Task Force elements to *reach back* from the battlefield to the domain expert to obtain detailed CB information required for their planning operations throughout the simulated military operation which involved a U.S. Joint Task Force intervention in an overseas conflict. The computed hazard assessments from the Simulator were then rapidly overlayed onto the situation maps at the Service's command centers. The Simulator results were accessed at Fort Bragg, Fort Gordon, Naval Research and Advanced Development Center, and the U.S. Army Chemical and Biological Defense Command. These centers were manned by NBC officers from the U.S. Army Chemical School, XVIII Corps, 3rd Army, Maryland NBC Reserve Unit, and our Modeling and Simulation Team.

JOINT FORCES EXERCISE 97-1. In October, our Modeling and Simulation Team participated in the Joint Forces Exercise 97-1. This exercise was sponsored by the U.S. Navy Joint Task Force and provided simulated battlefield scenarios for force elements ashore and afloat, augmented by expert domain simulation capabilities. These latter entities consisted of specific sites providing expertise and modeling for battlefield tactical planning and analysis, all linked together through encrypted networks. As the CB expert domain, our site provided real-time analysis of simulated CB events and shared the results over a secure network for collaborative planning and analysis by means of the Common Operational Modeling, Planning and Simulation Strategy system. This was done using the Chemical, Biological and Radiological Simulator for Planning tool, previously developed by our Modeling and Simulation Team for the ***1996 Joint Warrior Interoperability Demonstration***. Other participants included Defense Special Weapons Agency and naval task force ships (USS Mt. Whitney, USS Nassau, and USS Theodore Roosevelt) anchored off shore. POC: Mr. Jeffrey A. Kagan, Research and Technology Directorate, Commerical (410) 671-1765, DSN 584-1765, or email jakagan@agpea.army.mil

BIOPROCESS ENGINEERING. Mr. Dennis Lukens and Dr. Delia Ramirez delivered the Bioprocess Engineering Team's first product to a paying commercial customer, Life Technologies, Inc. The product was a cell line of competent bacteria to be marketed for recombinant DNA work, and the process for lyophilizing (freeze drying) cells to stabilize them for storage at -20 degrees. This is important because previous technologies required storage at -80 degrees, a condition that requires super cold freezers, which many small customers cannot afford. This process will also be directly applicable to military biotechnology products. POC: Mr. Dennis C. Lukens, Research and Technology Directorate, Commercial (410) 671-5923, DSN 584-5923, or email dclukens@apgea.army.mil

CONSTRUCTION OF MS AND MS/MS LIBRARIES FOR AUTOMATED BIODETECTION. Recently, ESI-MS and MS/MS data of whole intact bacterial cell suspensions (Bacillus anthracis, Francisella tularensis, Brucella melitensis and Yersinia pestis) and their proteolytic fragments were collected using a commercial desktop commercial ion-trap system. Sample preparation prior to MS analysis was insignificant.

This methodology, when fully developed, has great potential for field applications. Analysis of MS data revealed several specific biomarkers for these pathogens as well as their non-pathogenic counterparts. The investigation has indicated great potential for generating genus, species and strain specific biomarkers for all of these bacteria and the results are comparable with our earlier MALDI-MS approach. A collaborative effort has been set up with Prof. John Yates, Univ of Washington, to apply his software to generate the ESI-MS libraries of biological agents. We have transferred our data and tested the probability of generation of the MS library using the system at the Univ of Washington. We have also identified three peptides originating from Bacillus anthracis, by applying the same procedure for comparing our spectral data with the protein data bases, to be from Bacillus cereus. This is a remarkable observation considering that B. anthracis has several similarities with B. thuringiensis and B. cereus. One of our proposed approaches to be undertaken for automated detection of biological agents, is thus proven to be viable. Further efforts are being pursued to generate a complete self contained MS library which could be easily transferred from one tandem mass spectrometer to the other and will have a universal application for all ESI-MS methodologies for biodetection. POC: Dr. Thaiya Krishnamurthy, Research and Technology Directorate, Commercial (410) 671-5909, DSN 584-5909, or email txkrishn@apgea.army.mil

UNMANNED AERIAL VEHICLE RIOT CONTROL DELIVERY. The Target Defeat Team recently supported this program, which was sponsored by the U.S. Marine Corps. The objective was to demonstrate the ability to deliver various payloads including irritants and pyrotechnic whistles via an UAV for crowd control purposes. This was a joint service multi-laboratory effort that included the Edgewood RDE Center and the Naval Systems Weapons Command at Dahlgren and Indian Head. Dahlgren provided UAVs, pilots, flight crew, and payload integration. Indian Head provided fire control and design modification of flare decoy dispensers to deliver pyrotechnic payloads. ERDEC provided dissemination of payloads and test facilities and support. POC: Mr. George E. Roberts, Target Defeat Team, Commercial (410) 671-3400, DSN 584-3400, or email gerobert@apgea.army.mil

CBDCOM'S ELECTRONIC BULLETIN BOARD (known as bboard). In what may be a first for our ***bboard***, a posting of excess property (batteries) by the Mask Core Team resulted in a savings to the government of over $3,000.00. When asked if they could use these batteries and would be willing to fund the shipment, the Dismounted Battlespace Battle Laboratory eagerly accepted. Nine cases, of 40 batteries each ($1,00.00 per battery), were sent to the Dismounted Battlespace Battle Laboratory for a shipping cost of about $300.00. This also freed up much needed storage space for the Mask Core Team.

RISK AWARENESS HEALTHY LIVING SERIES. Our Service Oriented Support Team presented ***Here's to Life***, the first event in the U. S. Army Chemical and Biological Defense Command's Healthy Living Series. In support of risk awareness the series focused on balancing work, home, and community in times of change. The stress we face daily can effect how we perform at work and how we relate to those around us. The goal of the series was to provide alternatives to stress relief and prevention, relaxation methods, health, and nutrition as well as community and home safety. Presentation topics included controlling anger and aggression and heart healthy nutrition. Over 200 employees attended the events or participated in the command's stand down on October 29-31. POC: Ms. Tina M. Waters, Operations Directorate, Commercial (410) 671-2489, DSN 584-2489, or email tmwaters@apgea.army.mil

UNITED STATES AND GERMANY
ENVIRONMENTAL TECHNOLOGY DATA EXCHANGE

The *10th Anniversary Meeting of the US/GE Environmental Technology Data Exchange* was held in Koblenz Germany, in October. Areas of the United States and Germany Data Exchange Agreement include:

- Hazardous Materials and Pollution Prevention
- Soil, Contamination and Remediation
- Water, Pollution and Treatment
- Demilitarization.

There were 59 technical presentations, approximately half from each side, with 35 United States scientists and approximately 65 German scientists participating.

Mr. Gary Vest at Podium
Photo by Dr. Ron Checkai

Mr. Gary Vest, Principal Assistant Deputy Under Secretary of Defense-Environmental Security, in his new role as U.S. Executive Officer of the Data Exchange Agreement, spoke on the Department of Defense's International Program in Environmental Technology.

Mr. Vest praised the U.S./GE Environmental Technology Data Exchange Agreement for its productivity and longevity and challenged it to continue to progress.

Mr. Joseph Vervier, U.S. Project Officer, led the United States in executive sessions; Dr. Randall Wentsel, U.S. Assistant Project Officer, co-chaired the Data Exchange Agreement meeting; and Dr. Ronald Checkai, U.S. Deputy Assistant Project Officer, gave three technical presentations.

Participating German Data Exchange Agreement officers were Mr. Wolfgang Roth, Dr. Wilhem Sommer, and Mr. Walter Lindner, German Executive Officers; Mr. Manfred Rottle, German Project Officer; and Mr. Guido Lennertz, German Assistant Project Officer, co-chair of the meeting.

The next full meeting of the US/GE Environmental Technology Data Exchange will be held in 18 months in the United States.

POC: Dr. Ronald T. Checkai, Commercial (410) 671-2129, DSN 584-2129, and Dr. Randall S. Wentsel, Commercial (410) 671-2036, DSN 584-2036

COOPERATIVE R&D WITH INDUSTRY AND ACADEMIA

The Edgewood RDE Center is continuing its commitment to active involvement in the area of ***technology transfer***. Some of the recent significant achievements and actions include:

- The Center for NBC Environmental Technology partnered with the Chemical and Biological Defense Establishment - Porton Down, UK, to demonstrate the use of a portable containment system for use in remediation of explosively configured munitions containing World War I gaseous material. The evaluation, coordinated through the Tri-Lateral Agreement of site clean-up, remediation, and demilitarization also provided the opportunity to evaluate the capability of Open Path-FTIR to detect chemical weapons material on a real-time basis. Preliminary results indicate exceptional promise for both technologies.

- The Center for NBC Environmental Technology assisted the State of Missouri's Department of Natural Resources and the Department of Energy in evaluating the capability of air monitoring systems based on OP-FTIR technology for the qualification of fugitive emissions at Department of Energy facilities. The study, performed at the Kansas City Plant (managed for the Department of the Energy by Allied Signal Corporation), involved placing an OP-FTIR system on the roof of a production facility and measuring the emission from various stacks and vents. The system was able to detect a number of compounds on a real-time basis.

- The Center for NBC Environmental Technology will be meeting with Armitage Associated L.C. to discuss the possibility of exchanging information on American-based, environmental technologies being evaluated by the Center. Armitage has been tasked by the Department of Energy's EM50 program to assist in finding markets for technologies that have been developed in part by national laboratories in the Asian markets.

- Dr. William Hadden of the U.S. Department of Agriculture's Method Development and Test Laboratories in Albany, CA, indicated an interest in the application of our MALDI-Mass Spectrometry methodologies for the direct analysis of bacterial pathogens in monitoring food, including dairy and poultry products. Dr. Hadden has already initiated steps to set up MALDI-MS instrumentation in his laboratory. He asked that Dr. Thaiya Krishnamurthy of our Research and Technology Directorate provide consultative services on his project and extended an invitation for her to make a presentation at a seminar to be held in his facility. This is an example of the technology transfer possibilities in the detection of agents of biological origin and opens the possibility of future research.

- Advanced System Concepts Directorate sponsored a 1-day, on-site Technology Transfer course in October. A total of 17 people were trained on technology transfer definitions, intellectual property, Cooperative Research and Development Agreements, patents, licensing agreements, and marketing (commercialization). Mr. Sajonia and Mr. Wittig, GEO-CENTERS, Inc., did a superb job, training and sharing technology transfer knowledge and their experiences in that field. Attendees responded positively to the training, and some of them plan to follow-up with the technology transfer efforts at the Edgewood Center.

- In September, Dr. Harold D. Banks spent almost 2 weeks in the laboratory of Professor Michael Graetzel, Director of the Institute of Photonics and Interfaces, Institute of Physical Chemistry, Department of Chemistry, Swiss Federal Institute of Technology in Lausanne. The purpose of the trip was to assess the progress of

the Graetzel group toward the goal of producing solar cells using nanocrystalline technology with sensitizer- impregnated semiconductors.

- In October, Mr. Roy C. Albert attended a meeting hosted by Dean John Hatfield, University of Baltimore Merrick School of Business, and presented our view of the first 3 years of our participation in the Center for Technology Commercializations "Lab to Market" Program. Other organizations attending were Walter Reed, NSA, the National Institute of Health, and the Naval Surface Weapons Center. Although there has only been one new company started as a result of this program, there was agreement that the program has been a benefit to our scientists and engineers as it has made them aware of the importance of patents and protecting intellectual properties. As a result of a brainstorming session, the University of Baltimore will reevaluate the "Lab to Market" Program and consider things such as marketing laboratory technology and matching CRDA partners for immature technology.

Two sessions of "Customer Service: The Competitive Edge" were conducted in October. Over 100 people have been trained in the last 2 months. The final sessions were held in December.

POCs: Mr. Roy C. Albert, Technical and Scientific Information Team, DSN 584-4438, email address is rcalbert@apgea.army.mil, or Mr. John A. Rakaczky, Office of Research and Technology Applications, DSN 584-5387, email address is jarakacz@apgea.army.mil

TECHNICAL INDUSTRIAL LIAISON

Small Business Innovation Research (SBIR) 96-2:

Twenty-six Phase I proposals were evaluated at Edgewood and the Army has approved seven forcontract award. All were awarded within the required timeframe. To meet this deadline, we used a teaming approach with all parties involved in the preparation, approval, and implementation of the contract awards.

The proposals address the following topics:

(1) Miniature MALDI-TOF Mass Spectrometer (1 proposal selected)

(2) High Performance Aerosol Collectors (1)

(3) Nanotechnology and Microelectromechanical Sensors (1)

(4) Combinatorial Biology and Genetic Super Libraries (2)

Six topics were forwarded to ARO-Washington for inclusion in SBIR 97-2, which will open in May 1997 and close in July 1997. The six topics are:

(1) Biologically-Generated Multispectral Obscurants;

(2) Optimizing and Modeling Genetic and Bioreactor Parameters of Recombinant Protein Products;

(3) Imaging Sensor for Enhanced Standoff Chemical Detection;

(4) Handheld Biological and Chemical Detector;

(5) Directional Gamma/x-ray Detector;

(6) Intermolecular Force Measurements for Molecular Identification.

The Army has approved the award of four Phase II SBIR proposals. Contract awards are to be made by March 31, 1997.

Broad Agency Announcement (BAA) 97-1:

Edgewood's BAA is available to industry through our Web Site. This announcement will remain open through June 1997.

Advance Planning Briefing for Industry (APBI):

The next CB mission area APBI will be held March 25-26, 1997, at the Kossiakoff Center, Johns Hopkins Applied Physics Laboratory, in Laurel, MD. The main agenda topics follow:

APBI AGENDA

25 March:

7:00-8:30 Registration
8:30 Administrative Remarks
8:35 Welcome
8:40 CB Mission Area Overview
9:20 Keynote Address
10:00 Break
10:30 Joint Service Integration Group Update
11:00 Production Contract Opportunities
11:25 Chemical Equipment for Industrial Base Operations
11:45 Lunch

Contamination Avoidance

1:00 Joint Point Detection System
1:15 Joint Biological Remote Early Warning System
1:30 Joint Chemical Agent Detector
1:50 Joint Warning and Reporting Network
2:05 Joint Light Nuclear, Biological and Chemical Reconnaissance System
2:20 Joint Service Chemical Warning and Identification Lidar Detector
2:35 Break
3:00 Water Monitor
3:15 Chemical Imaging System
3:30 Thermoluminescence
3:45 Application for Flow Cytometry to Biological Defense
4:00 Chemical Biological Distributed Interactive Simulation
4:20 Adjourn

26 March:

8:30 Administrative Announcements

Chemical Demilitarization/Disposal

8:35 Chemical Demilitarization Program Overview
9:05 Update of the Chemical Stockpile Disposal Project
9:35 The Alternative Technology Program
10:05 Break

Medical CB Defense

10:35 Medical Research and Materiel Command Programs
11:20 Navy RDA for CB Defense
12:00 Lunch

CB Protection

1:15 Collective Protection R&D
1:30 Joint Service Lightweight Integrated Suit Technology Ensemble
1:50 JSLIST P3I
2:10 Special Purpose Clothing
2:30 Materials for Chemical Protection
2:50 Closing Remarks
3:00 Adjourn

Heads Up to Our Industrial Partners – Commercial Technology Insertion Program:

As part of Department of Defense's dual use technology strategy, the military is seeking commercial technologies to reduce costs, shorten acquisition cycle times, and obtain technologically advanced defense equipment. This program provides funding to facilitate the insertion of commercial technology into defense systems by overcoming barriers such as qualification, adaptation of commercial technologies to military applications, or modifications to military systems. Commercial technologies are defined as those technologies that are in widespread use in commercial products or are expected to find widespread acceptance in the near future.

Commercial technologies best suited to this program are those that will positively impact life cycle costs, increase the technological superiority of defense systems, have widespread service applications, and have reasonable technical feasibility.

The Edgewood Enterprise is interested in participating in the Commercial Technology Insertion Program and we are looking to our industrial partners for technologies that address CB defense issues and meet the criteria of the program. We expect to receive a call for nominations in the Feb-Mar 1997 timeframe. If you know of commercial technologies which may be applicable, please contact me.

POC: Mr. Ronald P. Hinkle, Technical Industrial Liaison, DSN 584-2031, commercial (410) 671-2032, or email rphinkle@apgea.army.mil

HISTORICALLY BLACK COLLEGES AND UNIVERSITIES

Professor A. Baumstark of Georgia State University in Atlanta is an internationally renowned scientist in oxidation chemistry. Part of his current research is supported by the Historically Black Colleges and Universities program sponsored by the Edgewood RDEC. Encouraged by Dr. Ferriter, Director of our Research and Technology Directorate, to collaborate with scientists funded by the HBCU program, Dr. Fu-Lian Hsu visited Dr. Baumstark in October to perform experiments in his lab with the help of his graduate student, Mrs. E. Mdichelena-Baez and senior research scientists, Dr. P. Vasquez and Dr. Y. Chen. A lewisite simulant prepared by Dr. Hsu was used for these experiments.

POC: Dr. Harold D. Banks, Research and Technology Directorate, Commercial (410) 671-8812, DSN 584-8812, email hdbanks@apgea.army.mil

INTERNATIONAL COOPERATIVE R&D

In September, Dr. Elke Reifer from the Wehrwissenschaftliches Institut fuer Schutz-technolgien - ABC Schutz (Federal Institute for NBC Protection Technologies), Munster, Germany, visited the Edgewood RDE Center. Dr. Reifer is project leader for Germany's development efforts in respirator design and collective protection. It was very interesting to discover that the concept chosen by the Germans for further development as their NBC Protective mask for the year 2000 and beyond bears a striking resemblance to our latest concept prototype for the *Joint Service General Purpose Respirator.*

Dr. Joseph DeFrank, Environmental Technology, attended the 60th meeting of NATO Land Group 7 (LG.7)(NBC Defence), at NATO Headquarters, Brussels, Belgium, on 25-27 Sep 96. As Chairman of NATO Project Group 31 (PG.31), Dr. DeFrank provided a courtesy briefing to LG.7 on its programs dealing with the development of enzyme-based decontaminants for nerve agents and mustard. PG.31 currently consists of France, Germany, and the United States (lead nation). LG.7 strongly supported the report and encouraged the greater participation of nations in PG.31. LG.7 will recommend to the NATO Army Armaments Group (NAAG), to which both LG.7 and PG.31 report, the expansion of PG.31's Terms of Reference (TOR) to include decontamination of agents of biological origin. LG.7 will also support a request by PG.31 to the NAAG for a two-year extension to complete its work. Prior to the LG.7 meeting, Dr. DeFrank briefed the Air and Naval Sub-Groups of LG.7. The efforts of PG.31 were discussed in respect to decontamination issues of particular concern to air and naval forces. As an expert in non-corrosive decontamination systems, Dr. DeFrank also participated in a session of LG.7 dealing with shortfalls in NBC defence that were identified by the NATO Senior Defence Group on Proliferation. The next meeting of PG.31 is scheduled for 24 Jan 97 at NATO Headquarters, Brussels.

Ms. Juanita Keesee and Dr. George Famini attended the *International Points of Contact/ Standardization Group Commanders*' conference in October. During the conference, LTG Benchoff, AMC's Deputy Commanding General, briefed on International Cooperative Programs as "We Enter the 21st Century." MG Garrett, Military Deputy to the Deputy Under Secretary of the Army [(International Affairs) (DUSA(IA)], provided a brief overview of the new Office of the DUSA(IA) and the Army's Cooperative Opportunity Groups. Briefings were also provided on the following topics: The Perspective on InternationalCooperation From the Office of the Under Secretary of Defense (Acquisition and Technology); the International Annex to the Science and Technology Master Plan; briefings by each Standardization Commander on activities currently ongoing in their respective country (FR, GE, AS, and the UK); the Financial Outlook; and the Foreign Comparative Test Program. The Director of Army Programs, Mutual Defense Assistance Office-Japan, presented activities ongoing in Japan. With resources continuing to dwindle, the importance of international was emphasized throughout the day.

POCs: Dr. George R. Famini or Ms. Juanita M. Keesee, International Programs Office, Commercial (410) 671-2552/5376, DSN 584-2552/5376, email grfamini@apgea.army.mil or jmkeesee@apgea.army.mil

CUSTOMER SATISFACTION AT THE EDGEWOOD ENTERPRISE

"Satisfaction of our customers' requirements defines quality for us."

In Issue No. 9, we stated that we had sent surveys out to our customers. We are in the process of tabulating the results of these surveys. There were two surveys developed, one for the Battle Laboratories and one for other external customers.

In June, our Director of Advanced Systems Concepts visited the Combat Service Support Battle Lab, the Early Entry Lethality and Survivability Battle Lab, and the Dismounted Battlespace Battle Lab. He met with them for face-to-face discussions and left surveys for them to complete and mail back to us. As a result, we pushed the *Water Monitor* into an Advanced Concepts and Technology Program II and got our Research and Technology Directorate started on a water monitor program in FY97. We got four of five efforts into the Military Operations in Urban Terrain Advanced Systems Concepts Demonstration, and we are working to make the CB modeling compatible with the Early Entry Lethality and Survivability Battle Labs' models.

For other external customers, our Directors and Program Managers provided addresses for 184 customers. These addresses were consolidated to preclude more than one survey being sent to the same address. In October, we mailed 139 surveys. To date, over 60 have been returned. Data from the surveys were put in an ACCESS database from which we can extract information in several forms; e.g., charts or graphs. The surveys were then sent to the respective Director or Program Manager for followup with the customer.

Of the surveys returned, 93 percent gave us an overall grade of satisfactory to highly satisfactory. For those who took the time to answer our survey, we thank you. We appreciate you taking the time to respond. If you still have a survey, you can send it to Technical Director, U.S. Army Edgewood Research, Development and Engineering Center, ATTN: SCBRD-ASC, Aberdeen Proving Ground, Maryland 21010-5423, or you can provide us your comments electronically at cu-team@apgea.army.mil.

U.S. ARMY CHEMICAL AND BIOLOGICAL DEFENSE COMMAND'S DEPUTY TO THE COMMANDER RECEIVES DECORATION FOR EXCEPTIONAL CIVILIAN SERVICE

Mr. Michael A. Parker
Deputy to the Commander

The Army's highest civilian honorary award is the **DECORATION FOR EXCEPTIONAL CIVILIAN SERVICE**. This award consists of a medal, rosette, and citation certificate. On November 14th, Mr. Michael A. Parker was one of the five recipients of this award.

Mr. Parker, as Deputy to the Commander, directs the Army's intensified research, development and acquisition process; readiness for chemical materiel; and technical support to its sister services and to Department of Defense agencies.

Mr. Parker was recognized for demonstrating unparalleled leadership in restructuring America's overall chemical and biological defense program. He was instrumental in the formation of the U.S. Army Chemical and Biological Command to oversee research, development, and acquisition of chemical and biological defense equipment and to ensure world-wide commitment to chemical weapons demilitarization and compliance with the 1993 Chemical Warfare Convention. He led a panel of senior leaders dedicated to standardizing chemical and biological defense equipment across the Department of Defense and within NATO. His personal initiative and innovative thinking led to the development of new Joint Service procedures for horizontal integration and coordination of program decisions, and to addressing Congress with a single, proactive voice. Mr. Parker's efforts culminated in a Joint Service Agreement for unified management of the chemical and biological defense programs of all the Military Departments. The Agreement implements Public Law 103-160 and ensures that the chemical and biological defense mission area is viewed respectfully to counter the proliferation and use of weapons of mass destruction.

Mr. Parker previously served as the Technical Director of the U.S. Army Chemical Research, Development and Engineering Center. He also served as Acting Project Manager for Binary Munitions and Chemical Munitions and as Science Advisor to the Commanding General, U.S. Army Japan.

A native of St. Louis, MO, Mr. Parker holds a Bachelor of Science degree in Mechanical Engineering from the Missouri School of Mines and Metallurgy. He also attended the University of Michigan and Johns Hopkins University Schools of Engineering. Among his awards and decorations are the *Army Research and Development Achievement Award*, the *Army Commander's Medal*, the *Army Meritorious Civilian Service Award*, and the *Presidential Rank Award*.

Mr. Parker and his wife, Carolyn Sue, reside in Bel Air. They have two daughters, Jennifer and Jessica.

POC: Ms. Suzanne M. Fournier, Public Affairs Office, Commercial (410) 671-4347, DSN 584-4347, or email smfourni@apgea.army.mil

CHEMICAL AGENT SAFETY AWARDS

*Two Edgewood Enterprise employees were recipients of **1996 U.S. Army Materiel Command Chemical Agent Safety (CAS) Awards**. The Army Materiel Command issues awards for CAS professionals in the safety engineer and safety and occupational health job series and for individuals (safety non-professional) contributing to the CAS program who are not in the CAS career field. Mr. Timothy Blades, Team Leader, Chemical Support Division, was the recipient of the safety non-professional award and Ms. Carol Eason, Safety Office, was the recipient of the safety professional award.*

Mr. Timothy A. Blades

Mr. Blades was commended for his exceptional knowledge and leadership skills in the chemical safety program. His innovative approaches and ability to carry out a variety of extremely hazardous operations world-wide in a safe manner, demonstrate his ability to lead programs and people under extremely adverse conditions. Mr. Blades has also served on many specialized teams as a recognized expert in the areas of chemical weapons materiel, munitions, and contamination. Most recently, Mr. Blades has served as the U.S. representative (up to and including team leader and chief inspector) on four UNSCOM missions to Iraq in an effort to verify Iraqi chemical agent capabilities. Additionally, he has performed consulting services for U.S. authorities on the subject of Gulf War Syndrome and is considered a leading expert in the area of remediation of chemical warfare unexploded ordnance throughout the United States.

Mr. Blades has also supported and pursued many innovative ideas that have or will have a lasting impact on the safety of chemical operations into the next century. His initiatives include commercial protective clothing for chemical agent operations, the Munitions Assessment Facility (which will be built in Edgewood within the next 2 years), and the Portable Isotopic Neutron System (PINS) for non-destructive assessment of chemical munitions.

Ms. Carol A. Eason

Ms. Eason was commended for her exceptional technical and managerial skills in the chemical safety program. Her support of the Army and AMC staffs in the areas of commercial protective clothing and the rewrite of the Army Chemical Safety Program demonstrate her overwhelming

ability to lead and manage programs and people under extremely adverse situations. During this period of time she has worked with individuals from around the Army to build, through consensus, a chemical safety requirements document that addresses chemical activities' concerns, meets national and international safety and occupational health standards, and consistently focuses on better ways to reduce risk in the work place. Ms. Eason has caused a significant paradigm shift throughout the chemical community by incorporating risk assessment methodologies into the Army Chemical Safety Program. In addition, she has been instrumental in creating a process to permit the use of commercial protective clothing for work in chemical agent environments and has also been an active participant on a multidisciplined team charged with the mission of safely performing chemical agent demilitarization experiments both here in the United States and Saratov, Russia. As part of this effort, Ms. Eason assisted in the development of a joint United States/Russian safety, health, and environmental plan for the Saratov operations as well as spending 4 weeks in Russia setting up laboratory operations and ensuring that the experiments were performed in a safe manner.

Congratulations to both of these professionals for a job well done and for embodying the feelings here at the Edgewood Enterprise where we want to **"Do It Safely the First Time!!"**

POC: Mr. George E. Collins, Jr., Safety Office, Commercial (410) 671-4414, DSN 584-4414, or email gecollin@apgea.army.mil

PEOPLE IN THE NEWS

Many of our employees are recognized by outside organizations for their exemplary performance, and it is our pleasure to share this information. These people have made significant, positive contributions toward achieving our vision of being recognized as the world leader in chemical and biological related science, technology, engineering, and service.

In October, Dr. William Seegar of our Research and Technology Directorate appeared on **Good Morning America**. He discussed how he is using refined chemical agent detection technology developed here at Edgewood during the 1980s and 1990s to track migratory birds. This technology, coupled with advanced satellite tracking, is used to study and conserve threatened and endangered Neotropical migratory birds. Dr. Seegar has also spoken with National Public Radio.

*MG George E. Friel, CBDCOM Commander, presents an **AMC Cost Analysis Award** to Ms. Patricia H. O'Shea.*

Dr. William Lagna, Dr. Mark Althouse, and Mr. Kolodzey are recipients of the **U.S. Army Materiel Command's R&D Achievement Award for FY96** for their work on the Army Warfighting Experiment with the Lightweight Standoff Chemical Agent Detector.

Dr. Ronald T. Checkai, Environmental Technology Team, was officially commended for his outstanding poster presentation selected as the best within the technical session at the **20th Army Science Conference** in June. The award was presented under the auspicies of Gilbert F. Decker, Assistant Secretary of the Army, Research, Development and Acquisition. Dr. Checkai's presentation was entitled *Phytophysiological Response of Crops to Irrigation Waters Containing Low Concentrations of RDX and TNT: Ecotoxicological Implications*. Dr. Michael Simini, GeoCenters, Inc., was co-author. Dr. Checkai's presentation occurred within the Environmental Sciences and Geosciences technical session.

The Upper Chesapeake Chapter of the National Contract Management Association was notified that it will be presented a **Graalman** award for its efforts in acquisition and contracting education. The chapter was chartered at Aberdeen Proving Ground in 1988 by local procurement professionals. NCMA is a world-wide professional association devoted to excellence in public contracting. It provides those involved in Federal, state, and local government contracting and acquisition a neutral forum in which to come together to consider current issues and trends in the government procurement, contracting, and acquisition arena. NCMA draws its membership from industry, Government, academia, and the legal profession. The Upper Chesapeake Chapter has been active in promoting acquisition reform and in educating both contracting professionals and the organizations they support in new and better ways of doing business. The chapter does this primarily by bringing nationally prominent leaders and professionals to speak to audiences at Aberdeen Proving Ground and by sponsoring local seminars, symposia, or other training experiences. The chapter also provides its members leadership, teaming, and organizational development opportunies. Mr. George Hunt, a CBDCOM contract specialist, is currently the chapter president. According to Mr. Hunt "Winning the **Graalman** caps a team effort by a special group of local contracting folks willing to devote their own time to the future of the profession and its practice here at Aberdeen Proving Ground. I couldn't be more pleased."

The Department of Energy and Federal Interagency Energy Policy Committee presented Newport Chemical Depot with a **1996 Federal Energy and Water Management Award** in November. Newport earned the award by reducing FY95 natural gas use to 58 percent of FY94 consumption, saving more than $93,000 for that year. Installation engineers replaced an aging, inefficient gas-fired steam boiler heating system with several smaller, more efficiently located boilers. The depot also saved $13,500 in natural gas costs by working with the Defense Fuel Supply Center to change its supply contract based on spot market prices.

Mr. Roy Thompson was invited by the Army Research Office to serve on the **Technical Advisory Committee** for the development of a Biotechnology Information Facility at New Mexico State University.

SPC Young Pierce Gazaway of our Toxicology Team, Research Directorate, was named **CBDCOM Soldier of the Year**!

Upcoming Conferences		
Date and Place	*Title*	*POC*
10-12 February 1997 *Orlando, FL*	*AUSA Symposium*	*Ms. Brenda Eckstein* *Edgewood RDE Center* *(410) 671-2879* *fax: (410) 612-6529* *email: bceckste@apgea.army.mil*
25-26 March 1997 *Johns Hopkins Applied Physics Laboratory* *Laurel, MD*	*Advanced Planning Briefing for Industry*	*Mr. Ronald Hinkle* *Edgewood RDE Center* *(410) 671-2031* *fax: (410) 612-6529* *email: rphinkle@apgea.army.mil*
6-10 April 1997 *Atlanta, GA*	*1997 Simulation Multi-Conference*	*Mr. Michael Chinni* *(210) 724-4140* *email: mchinni@pica.army.mil*
24-26 June 1997 *Fort McClellan, AL*	*World Wide Chemical Conference*	*Ms. Joann Brucksch* *Edgewood RDE Center* *(410) 671-5383* *fax: (410) 612-6529* *email: jjbrucks@apgea.army.mil*

Edgewood Enterprise employees participate in many workshops, symposiums, and conferences; and many are recognized by outside organizations for their exemplary performance. It is our pleasure to share this information.

Mr. Kirkman Phelps, Joint Service Materiel Group Commodity Area Manager for *Contamination Avoidance*, was one of two invited presenters on current detection capabilities at the White House Military Office's **Third Annual Chemical & Biological Threat Awareness Conference** held in September at the National Defense University, Ft. McNair, Washington, DC. In addition to members of the White House staff, conference participants included the Secret Service, FBI, FEMA, Publich Health Service and other related government agencies. Object of the yearly conference is to increase awareness of the CB threat and to improve interagency communication and coordination.

Two papers were accepted for presentation at the **Third International Aerosol Symposium** to be held in Moscow, Russia, in December 1996. One is entitled "The Effect of Weather on the Atmospheric Loading of Aerosol Particulate Matter. Co-authors are various members of Biosystem Integration Team, Mr. Charles Clough of the Army Research Labortory, and Dr. Burton of the Environmental Protection Agency. The second is entitled "Portable High Throughput Liquid Absorption Aerosol Sampler." This paper will be authored by Dr. A. Birenzvige and Ms. Agnes Akinyemi of the Edgewood RDE Center and Dr. Solomon Zaromb, a previous National Research Council fellow and today president of Zaromb Corporation. Dr. Birenzvige will present papers.

Dr. James J. Valdes, Edgewood Center's Scientific Advisor for Biotechnology, recently presented a lecture entitled, "Emerging Biological Threats to the **Army After Next** (AAN)," and participated in a panel on "Weapons of Mass Destruction" at an Army After Next affiliated workshop at the Georgia Technical Institute. MG Bob Scales, Deputy for Doctrine, TRADOC, presented the keynote address and described a future Army characterized by precision engagement and dominant manuever, i.e., firepower and speed. The AAN concepts include strategic mobility, avoidance of attrition warfare, protection and sustainment in a bare based environment and battlespace transparency. The concepts are expansible, applying to wars on battles, and the object is not to butcher the enemy but to break his will to fight. Other workshops included "Who Are 'They' and How Will 'They' Fight?," "The Army in 2025," "Beyond Information Age Warfare" and "Technology, Warfare and The Future." Dr. Valdes was invited to lecture at the AAN course at the Army War College.

Dr. Jay Valdes and Dr. Joshua Lederberg were the invited speakers at SAIC's **Global Issues: Biotechnology** workshop. This workshop was initiated by Admiral William Owens (Ret), Vice Chairman of SAIC, as a forum to discuss the impact of biotechnology on international issues. Topics included, biodefense, environmental pollution, biomanufacturing, medicine, and agricultural biotechnology.

Dr. Valdes participated in the Naval Studies Board's technology panel entitled, "Technology for Future Naval Forces," held at the National Research Council, and presented three lectures. These were: "Biotechnology and The Future of Biodefense," "Environmental Biotechnology and Alternative Technologies for Demilitarization," and "Recombinant Antibody Manufacturing." The panel is charged with determining long-term

priorities for naval research and technology programs.

"Validation of the cytosensor for in vitro Cytotoxicity Studies" by Darrel E. Menking, R.J. Mioduszewski, C.J. Cao, V.I. Cortes, M.E. Eldefrawi, A.T. Eldefrawi and J.J. Valdes was presented at the **Biennial International Symposium on Alternatives in the Assessment of Toxicity**.

Research and Technology's Chemical Biological Counterterrorism Team (CBCT) represented CBDCOM and ERDEC at Soldier Systems Command (SSCOM) in Natick, MA for a Chemical/Biological Defense Technology Conference for New England First Responders to a CB Terrorist Incident. Technologies briefed by the CBCT included the Perimeter Monitoring System, IMS and SAW Chemical Mini-detectors, the Bio Diagnostic Kit, the Mobile Analytical Response System and Foam Mitigation and Vapor Suppression Systems.

In August, Dr. Harold D. Banks attended the **French equivalent of a Gordon Conference** in La Londe-les Maures, France. Unlike their American counterparts, GECO (Group for the Study of Organic Chemistry) conferences are largely for French scientists, and Dr. Banks was honored to have been the only American of the 80 scientists selected to present at this meeting. His presentation about recent calculations of relative reaction rates in oxidation and reduction reactions generated considerable interest. It would appear that many synthetic chemists are discovering the power of computational chemistry. In fact, if experimentation is minimized by focusing on reactions that are most likely to work, synthetic chemistry becomes more environmentally benign. (This is not to suggest that computations have reached the stage whereby the outcome of most reactions can be predicted.) Participation at this meeting provided an inside view of French organic chemistry at its best. Many stimulating talks were presented. Professor Henri Kagan (Paris-Orsay) gave an excellent talk on his recent studies on asymmetric synthesis. Dr. Jean-Pierre Majoral presented elegant work on dendrimers. Dr. Jean Suffert is performing research in the area of enediynes, an area of interaction and possible collaboration with a group at Clark Atlanta University.

CBDCOM was part of the **AMC Exhibit at the AUSA** in Washington, DC, in October. The exhibit consisted of an excellent simulation of what multispectral smoke will do to SMART weapons via both a visual obscurant demonstrator and an IR/MMW demonstrator.

Members of the Center's Advanced Systems Concepts Directorate attended a **Partnership Conference on Future Engineering Operations Concepts** at Fort Leonard Wood, MO, in October. The conference covered a broad array of topics including the Vision for Force XXI Engineering Operations, Requirements Determination, Concepts for Maneuver Engineering, Force Support Engineering and Terrain Visualization, and Future Operational Capabilities. Chairpersons from each of the Engineer School Integrated Concept Teams (ICTs) presented a status on their accomplishments to date. In addition, each RDE Center was invited to brief their perspective and possible contributions to the Engineer School mission. This is of particular interest to ERDEC due to the impending relocation of the U.S. Army Chemical School and MP School to Fort Leonard Wood. These three schools will join to form the Maneuver Support Center which is planned to be operational by FY99. The Center will also include a new Battle Lab, the Maneuver Support Battle Lab, which will address operations from emplacing mines to building bridges to runway repair, to NBC defense and smoke.

Dr. Amnon Birenzvige, an Edgewood Center scientist, briefed Center for Health Promotion and Preventive Medicine personnel on our Biosystem Integration team's effort to characterize the background aerosols. In discussions held following the briefing LTC Rinehart, the Director of the laboratory, expressed interest in collaboration with us and said he will support establishing a joint working group to evaluate

current needs for background aerosol information in theater of operation and recommend standard procedures for obtaining such information.

We recently hosted an **Independent Research and Development Conference on Chemical and Biological Science and Technology**. The conference provided a forum for interaction between government and industry technologists working in the CB defense arena. The first morning addressed the DoD CB defense management structure and strategies. The keynote speakers were Mr. George Singley, Deputy Director for Defense Research and Engineering, and Dr. Ted Prociv, Deputy Assistant to the Secretary of Defense for CB Matters. The afternoon briefings included overviews of contamination avoidance, individual and collective protection, and decontamination programs.

On the second day, firms briefed government panels on their IR&D programs which address CB defense. A total of 22 company presentations were heard. We envision this forum to become an annual event.

Dr. Nickolay Belov, president of the Russian Aerosol Society and director of the aerosol research laboratories in the Karpov Institute of Physics and Chemistry visited the Edgewood RDE Center in October. Dr. Belov delivered a **seminar on interaction of lasers with aerosols**. Dr. Belov has many years of experience in all facets of aerosol research. He conducted theoretical and experimental studies in aerosol dynamics, behavior of a single aerosol as well as aerosol clouds, interaction of aerosols with electromagnetic radiation, etc.

Journal and Magazine Articles

"Aquatic Toxicity of Chemical Agent Simulants as Determined by Quantitative Structure-Activity Relationships and Acute Bioassays" by Nancy A. Chester, Mark V. Haley, and Carl W. Kurnas (Environmental Technology); George R. Famini (International Programs); Patricia Sterling (summer faculty hire); and Leeland T. Wilson (LaSierra University) was published as a chapter in the **American Chemical Society's** book *Biomarkers for Agrochemicals and Toxic Substances*. The chapter discusses the validation of quantitative structure-activity relationship and theoretical linear solvation energy relationship models for use in predicting toxicity of chemical agent simulants to environmental species.

"Army Research: Yet Another Challenge" by Dr. James Baker, of our Research and Technology Directorate, was accepted for publication in a forthcoming issue of **Army RD&A Magazine**. This article details some of the changes in the management of the Army basic research program at the various RDE Centers over the last several years and suggests that not all of the changes have been helpful in promoting a technically competent staff.

"Chemical and Biological Counterproliferation Seminar War Game-95" by Mr. Van Jones, Dr. Richard Hutchinson, and Ms. Elaine Stewart-Craig was submitted to **Army RD&A Magazine**. This article addresses the counterproliferation war game, workshop, analysis results, and recommendations that were recently completed.

"A Panoramic infrared-imaging spectroradiometer model with reverse phase-modulate beam broadcasting" by Arthur H. Carrieri was accepted for publication in the **Lasers, Photonics and Environmental Optics** division of the *J. Appl. Opt*. In this work, an infrared wide-angle imaging sensor called PANSPEC is designed with optimum optical performance and details of its computer simulated (diffraction limited) image are presented. PANSPEC monitors a panoramic infrared environment for chemical clouds, detecting a presence once absorption or emission spectra characteristic of the chemical species is resolved. It employs a high-speed solid-state interferometer for spectroscopic detection and a (patent pending) sensor fusion technique for the electro-optical beam broadcasting of chemical presence and cloud heading.

"Rapid Identification of Bacteria by Direct MALDI-MS Analysis of Whole Cells," by T. Krishnamurthy and P.L. Ross, was accepted for publication in *Rapid Communications in Mass Spectrometry*. The article reports that several Characteristic ions (Biomarkers) were observed during the direct analysis of both gram-negative and gram-positive intact bacterial cells by a matrix assisted laser desorption ionization-mass spectrometry (MALDI-MS) technique. The entire process, involving absolutely no sample processing, could be completed in less than ten minutes. A number of specific biomarkers, generated reproducibly for each type of cell in the corresponding mass spectrum, permitted the identification as well as distinction of pathogenic bacterial from non-pathogenic counterparts. In addition, individual strains of a specific organism can be differentiated easily. Some of these biomarkers correspond to those observed earlier during the MALDI-MS analysis of protein extracts

of the same bacteria. This approach, which can yield valuable data for rapid classification and detection of micro-organisms, represents a substantial breakthrough for rapid screening of environmental as biological samples.

"Rapid Identification of Bacteria by Direct MALDI-MS Analysis of Whole Cells," was accepted for publication in *Rapid Communications in Mass Spectrometry*. The manuscript deals with the direct analysis of a variety of both gram-negative and gram-positive intact bacterial cells by matrix assisted laser desorption ionization-mass spectrometry . The entire process, involving absolutely no sample processing, could be completed in less than 10 minutes. The results also have been approved by the Edgewood RDE Center for patent applications on the developed methodologies. This investigation has led to collaboration with and memorandums of understanding with the U.S. Army Medical Research Institute for Infectious Disease and Bruker Analytical Systems.

"Nucleotide Sequence of a Gene Encoding an Organophosphorus Nerve Agent Degrading Enzyme from Alteromonas Haloplanktis" by Tu-Chen Cheng, Lin Liu, Baomin Wang, Jianlei Wu, Joseph J. DeFrank, David M. Anderson, and Amy H. Hamilton was accepted for publication in *J. Industrial Microbiology*. In this study, the gene for an enzyme (Organophosphorus acid anhydrolases: OPAA) from A. haloplanktis that is able to catalyze the hydrolysis of a wide range of G-type nerve agents, was cloned into E. coli. This paper further corroborates our earlier conclusion that the OPAA is a type of X-Pro dipeptidase, and that X-Pro could be the native substrate for such an enzyme in Alteromonas cells.

"Optical Properties of Horseradish Peroxidase From 0.13 to 2.5 Microns," by E.T. Arakawa and P.S. Tuminello (Oak Ridge National Laboratory), B.N. Khare (Cornell University), and M.E. Milham (Edgewood RDEC) was accepted for publication in *J. Biospectroscopy*. Optical characteristics such as light scattering and fluorescence of components in bacterial cells have been used to sort cells and to identify different classes of bacteria in a mixed suspension. More detailed studies require a knowledge of the optical properties of individual components of the cells. Since cells are composed largely of proteins, a measurement of the optical constants of horseradish peroxidase, a globular protein, would permit modeling of the refractive index profiles of complex, inhomogeneous structures such as bacterial spores. This article describes measurements of spectral reflectance and transmittance for horseradish peroxidase and the subsequent analysis by Kramers-Kronig techniques to obtain the real and imaginary parts of the complex refractive index.

FY96 PATENT REPORT

Our Intellectual Property program is off to a flying start. Since we now have an in-house patent counsel, John Biffoni, there has been increased interest and improvement in the patent process. As a result, our customers have responded favorably as evidenced by the fact that patent applications filed and patents issued have increased. The following provides information on patents at the U.S. Army Chemical and Biological Defense Command for FY96. Pending patents filed before FY96 are not reflected in this report:

Provisional Patent Applications Filed

1. Scavenging and Filtering of Airborne Particles Using Bubbles, Inventor: GENOVESE, JAMES A.

2. Cloning, Expression, and Nucleotide Sequence of a Bacterial Enzyme for Decontamination of Organophosphorus Compounds, Inventors: CHENG, TU-CHEN; DEFRANK, JOSEPH J.

3. Rapid Detection of Toxins, Inventors: WOOD, SHEILA J. ; SYSDISKIS, ROBERT J.

4. Micro Spot Test Methods and Field Test Kit for On-Site Chemical Inspections, Inventors: NOVAK, THADDEUS J.; AARON, HERBERT S.; BIGGS, TRACEY D.

5. Antibotulinum Fab Clone Constructs and Method for Preparations and Use, Inventors: VALDES, JAMES J.; EMANUEL, PETER A.; ELDEFRAWI, MOHYEE E. ; BURANS, JAMES P.

6. Super Toxic Analytical Glove Box, Inventors: HENRY, CHARLES E.; HEYL, MONICA J.; REUTTER, DENNIS J.

7. Alternative Methods to Gel Electrophoresis DNA Fingerprinting for Genetic Typing of Individuals and Species, INVENTORS: YEH, HOMER R.; WICK, CHARLES H.

8. Detection of Pathogenic and Non-Pathogenic Bacteria by Matrix Assisted Laser Desorption Ionization (MALDI)-Time-of-Flight Mass Spectrometry, Inventors: KRISHNAMURTHY, THAIYA; ROSS, PHILIP L.

9. Spinning Barrel Air Gun, Inventor: ZURKOWSKI, PAUL C.

Patent Applications Filed

1. Automated, On-Demand Ion Mobility Spectrometry Analysis of Gas Chromatograph Effluents, Inventors: GENOVESE, JAMES A.; HARDEN, CHARLES S.; SNYDER, A. PETER

2. Apparatus and Method for Measurement of Offgassing Rate, Inventors: PILIE, ROLAND J.; MCMAHON, THOMAS M.; MOSKAL, MICHAEL D.

3. Magnetic Biological Particle Detection System, Inventors: MENKING, DARREL E.; BARDITCH, IRVING F.; MILLER MARYALICE ; WARD, F. PRESCOTT

4. Fiber Chaff Disseminator, Inventors: ALTHOUSE, MARK L.G.; WILCOCK, KEVIN J.

5. In-Field Pathogen Detection, Inventors: WOOD, SHEILA J.; SIBLEY, DEBORAH E.T.; GUILBAULT, GEORGE G.; LUBRANO, GLENN J.

6. Millimeter Wave Obscurant Cutter, Inventor: HALE, D. JEFFREY

7. Earth Monitoring Satellite With Combined Infrared Interferometry and Photopolarimetry for Chemical and Biological Sensing, Inventor: CARRIERI, ARTHUR H.

8. Thermite Destructive Device, Inventor: SONG, EUGENE

9. New Culture Method, Inventors: BARDITCH, IRVING F.; MILLER, MARYALICE

10. Competitor Primer Asymmetric Polymerase Chain Reaction, Inventor: GILLESPIE, DAVID H. (Deceased)

11. Method for Producing Titanium Based Pyrotechnic Smoke Composition, Inventor: TRACY, GENE V.

12. Method of Measuring the Decomposition of a Gaseous Material under Controlled Temperature and Time Conditions, Inventor: ELLZY, MICHAEL W.

13. Neural Network Computing System for Pattern Recognition of Thermoluminescence Signature Spectra and Chemical Defense, Inventor: CARRIERI, ARTHUR H.

14. Adsorptive Cooler and Process for Adsorptive Cooling, Inventor: TEVAULT, DAVID E.

15. One-Window Cell for Testing Passive Remote Vapor Detectors, Inventor: FLANIGAN, DENNIS F.

16. In-Situ Derivation Adapter For an Infrared Pyrolyzer, Inventor: SICKENBERGER, DAVID W.

17. Decontamination Of Chemical Warfare Agents Using Activated Aluminum Oxide, Inventors: BARTRAM, PHILIP W.; WAGNER, GEORGE W.

18. Oxidative Detoxification of Phosphonothiolates and Phosphonothioic Acids, Inventors: YANG, YU-CHU; SAMUEL, JOHN B.; BEAUDRY, WILLIAM T.; SZAFRANIEC, LINDA L.; BUNTON, CLIFFORD A.

19. Amorphous Diamond-Like Fiber and Method of Synthesis, Inventors: BROCK, JAMES R.; SONG, KWANG-HO; KRETZCMAR, JOHN P.

20. Controlled Multi-Purpose Chemical Agent Vapor Generator System, Inventor: ONG, KWOK Y.

21. Process for the In-Situ Detoxification of Aminoalkyl Phosphonothiolates by Hydrolysis, Inventors: YANG, YU-CHU; SAMUEL, JOHN B.; BEAUDRY, WILLIAM T.; SAZFRANIEC, LINDA L.; ROHRBAUGH, DENNIS K.

22. Thermal Reflector Marking Panel, Inventor: ZURKOWSKI, PAUL C.

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1. 5,477,861 - Respiratory Test Circuits and Methods, Inventor: PULLEN, PAUL V.

2. 5,478,377 - Filter for A Respiratory Device and Method for Use, Inventors: SCAVNICKY, JOHN A.; GROVE, COREY M.

3. 5,517,026 - On-The-Move Surface Sampling Head for a Mass Spectrometer, Inventors: SICKENBERGER, DAVID W.; SARVER, EMORY W.

4. 5,523,235 - Apparatus for Growing Microorganism Cultures, Inventors: BARDITCH, IRVING F.; MILLER, MARYALICE

5. 5,525,475 - Diffusion Through a Membrane Assaying Apparatus and Method, (Government License Only) Inventor: LADOUCEUR, CYNTHIA A.

6. 5,532,150 - Method and Apparatus for Suspending Microparticles, Inventors: BRONK, BURT V.; ARNOLD, STEVE; HENDRIE, PIERS

7. 5,544,586 - Solid Fuel Ramjet Tubular Projectile, Inventor: HUERTA, JOSEPH

8. 5,546,862 - Remote Control Adapter for a Detonator System, Inventor: SCHABDACH, PAUL B.

9. 5,559,284 - Method for Determining Elongational Viscosity and Dynamic Surface Tension in Liquid Solutions, Inventors: MATTA, JOSEPH E. (Deceased); TYTUS, RAYMOND P.

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1. 5,560,511 - Hermetically Sealable Reusable Container, Inventor: MCNERNEY, JOHN L.

2. 5,568,186 - Focal Plane Filtered Multispectral Multidetector Imager, Inventor: ALTHOUSE, MARK L.G.

3. 5,569,580 - Method for Testing the Toxicity of Chemicals Using Hyperactivated Spermatozoa, Inventor: YOUNG, RONALD J.

Statutory Invention Registration Issued

1. H1562 - Heat Sensitive Liquid Chemical Agent and Pesticide Detector and Method of Using, Inventors: ALBRECHCINSKI, THOMAS M.; AKERS, CHARLES

2. H1563 - Chemical Agent Monitor Immunoassay Detection, Inventors: SNYDER, A. PETER; MILLER, MARYALICE; BLYTHE, DAVID A.

Patent License Agreements (PLA)

PLA for a non-exclusive license for U.S. Patent Nos. 5,059,349; 5,059,352; and 5,076,965 in the area of filter testing technology between Abbott Laboratories and the U.S. Army Edgewood Research, Development and Engineering Center, (Inventors: CARLON, HUGH R.; GUELTA, MARK A.; GERBER, BERNARD V.)

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TECHNICAL REPORTS

Published technical reports, when available, should be requested from the Administrator, Defense Technical Information Center, ATTN: DTIC-FDRB, 8725 John J. Kingman Road, Ste 0944, FT Belvoir, VA 22060-6218.

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ERDEC-CR-211	Decontamination of Surfaces and Air Utilizing Hydrogen Peroxide and UV Light, September 1996, UNCLASSIFIED Report - limited.	H. O'Donnell E. Karlsson O. Weres P. Bartram
ERDEC-CR-213	Market Survey of High Pressure Washer Systems for Decontamination, October 1996, UNCLASSIFIED Report - limited.	D. Fowler J. Traino W. Tranum D. Deane R. Bucci
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The **Edgewood Enterprise** is located at the Edgewood Area of Aberdeen Proving Ground, Maryland; a small detachment of about 30 people is located at Rock Island Arsenal, Illinois.

The U.S. Army Chemical and Biological Defense Command (CBDCOM) is primary focal point within the Department of Defense for NBC matters. The Edgewood Enterprise is the largest of three elements within CBDCOM that execute the NBC mission. The relationship between CBDCOM and the Enterprise is more that of a supplier and customer rather than that of a superior and subordinate. Each depends on the other for essential products and services.

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